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The Canadian Builder and Carpenter

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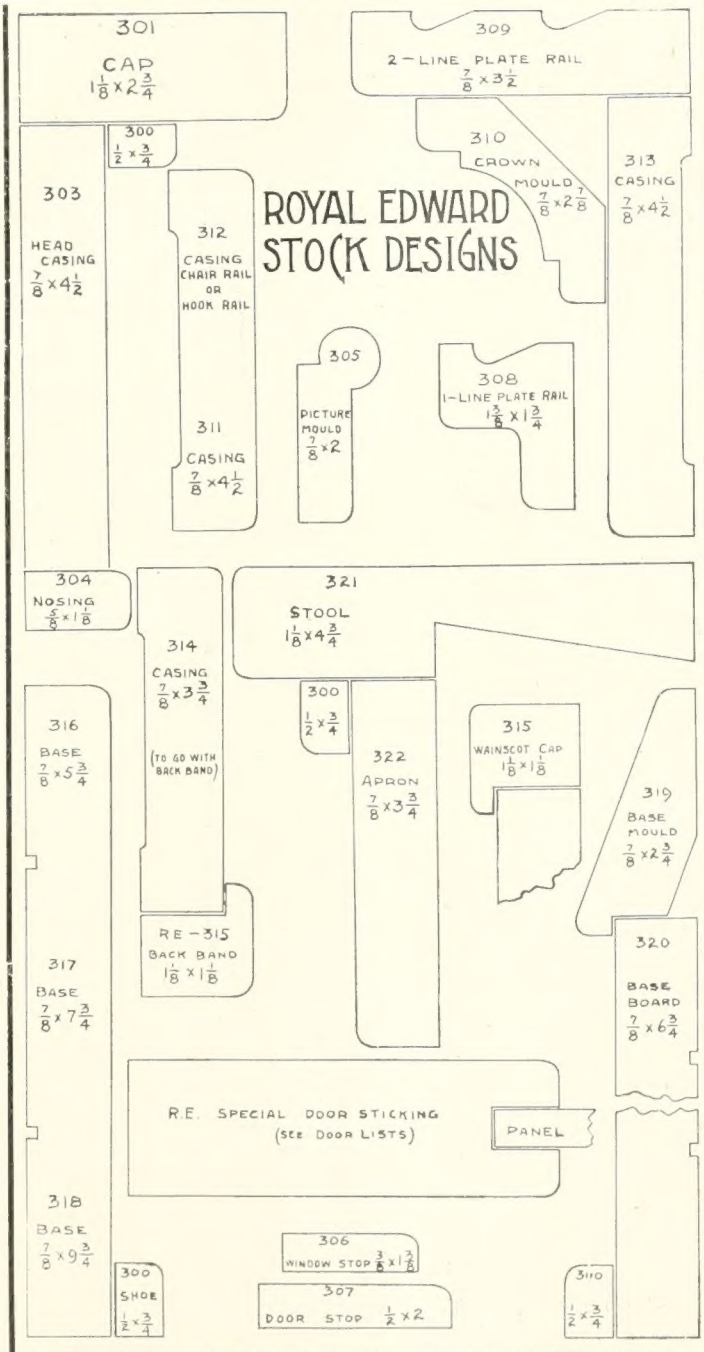

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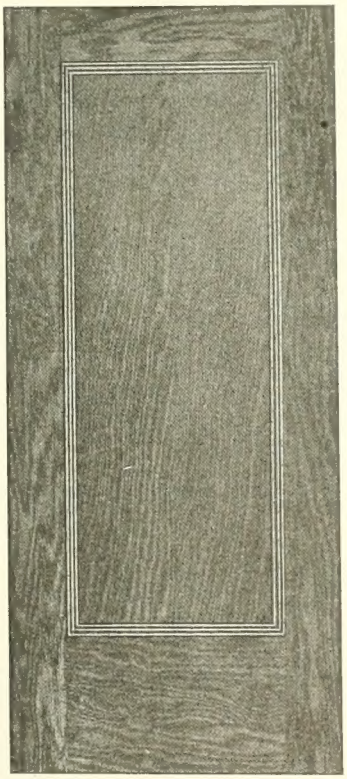

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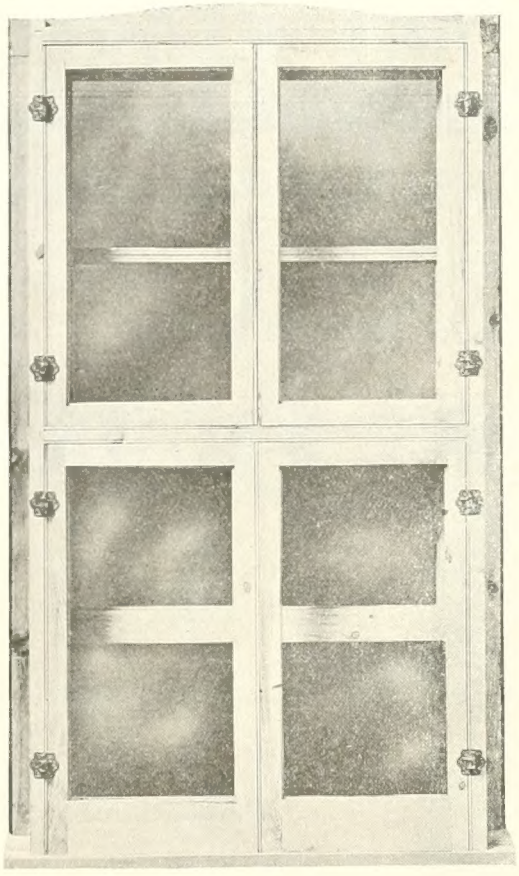

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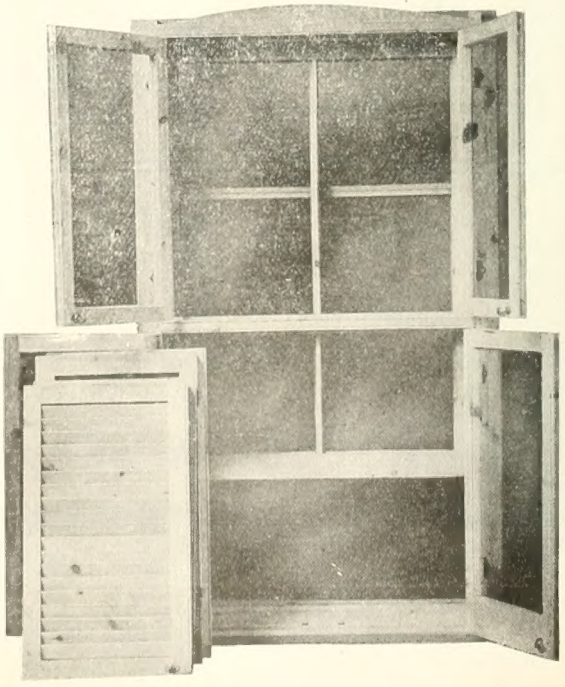

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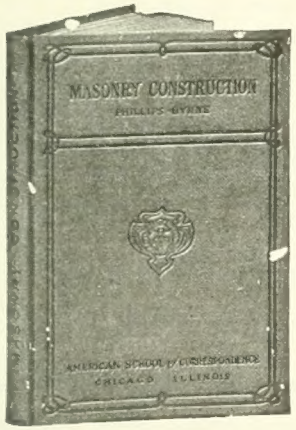

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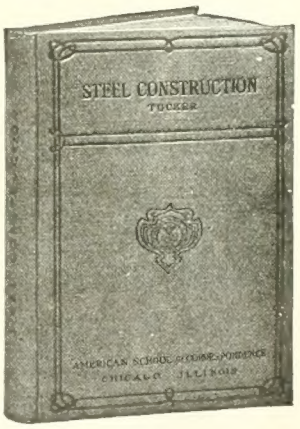

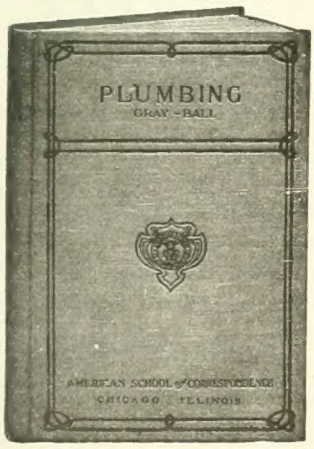

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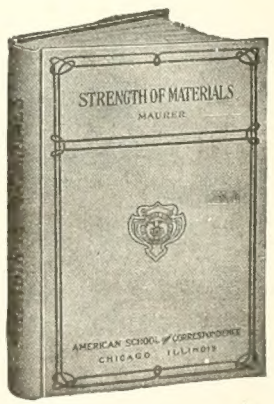

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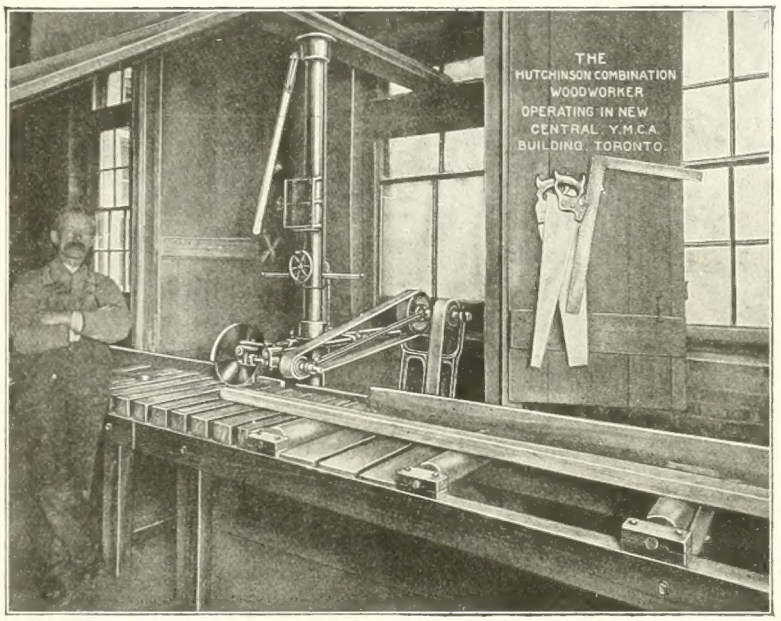

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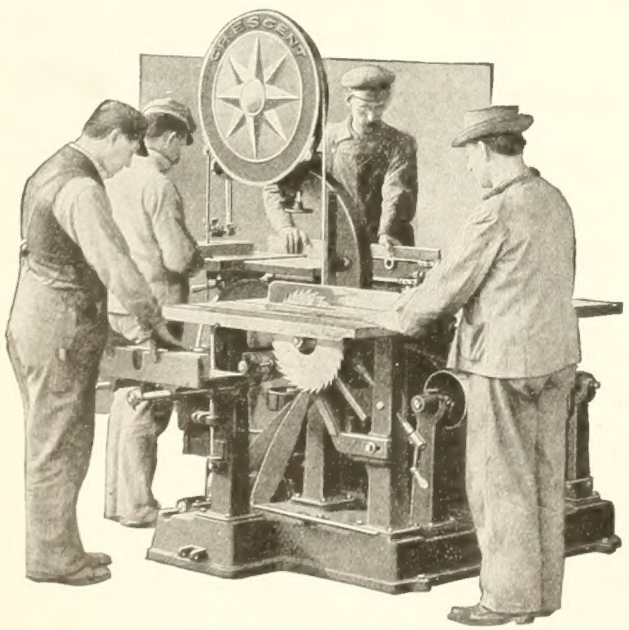

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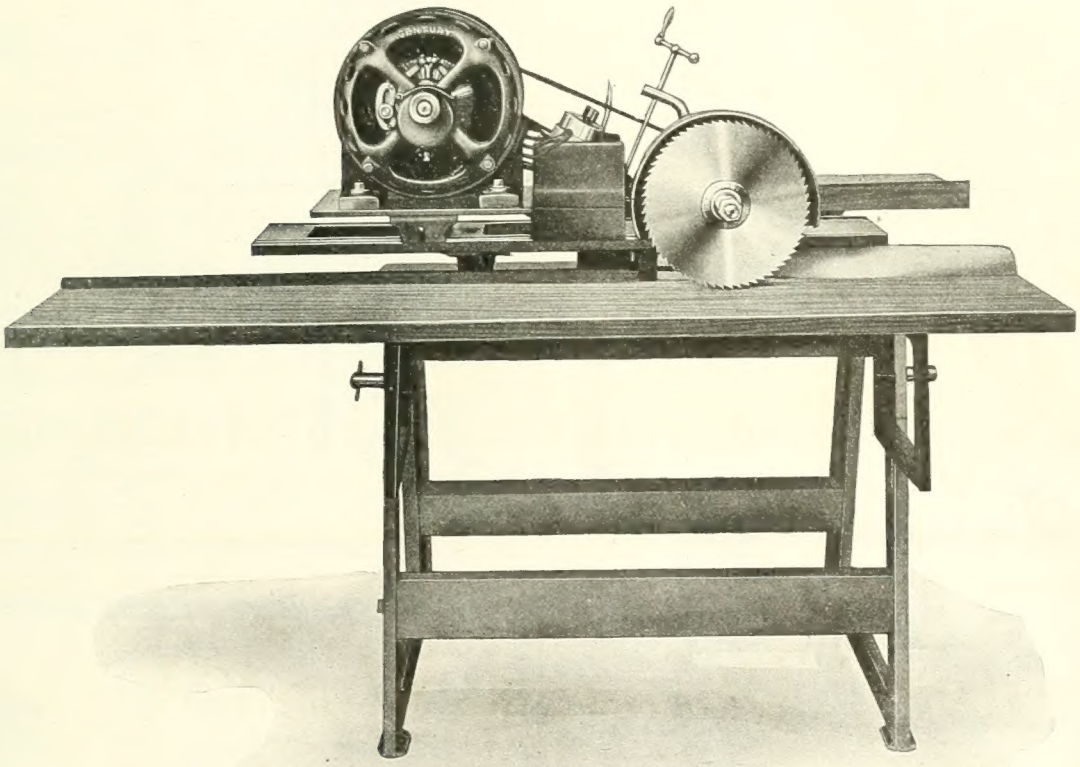

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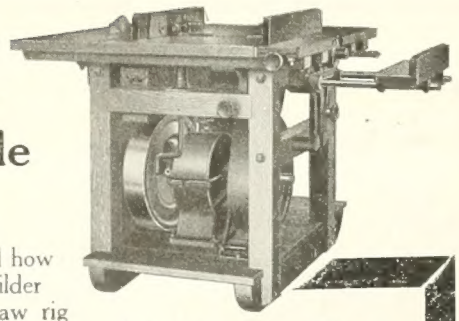

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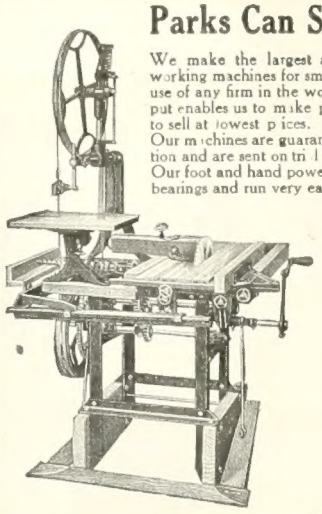

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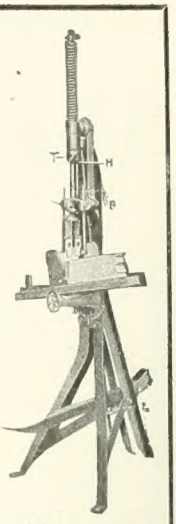

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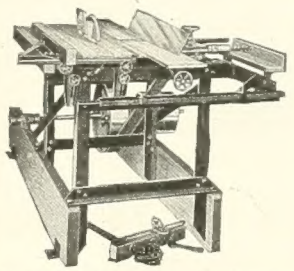

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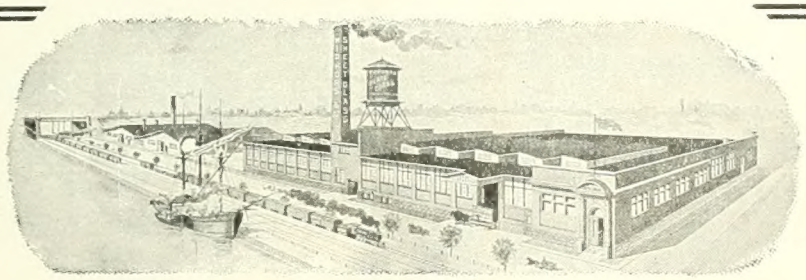

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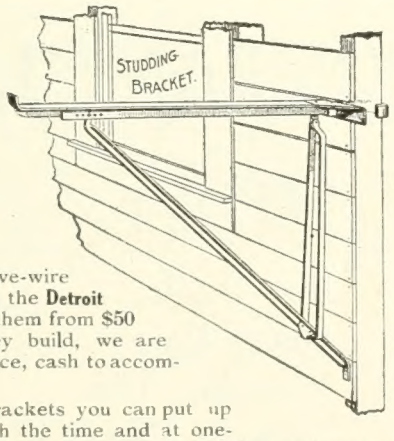

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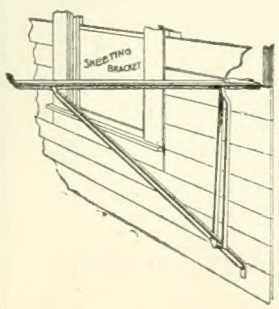

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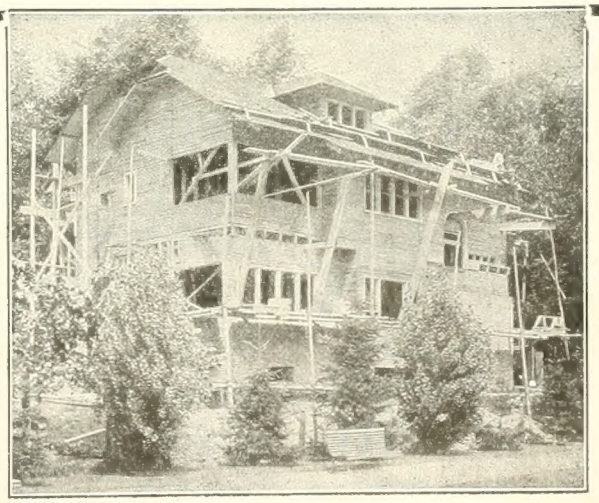

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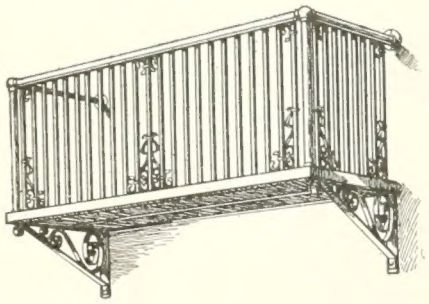

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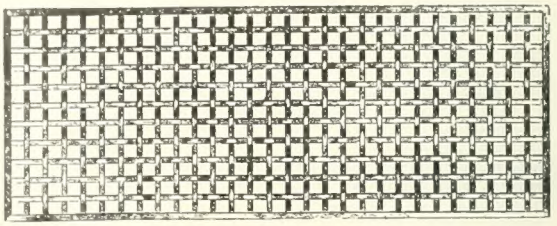

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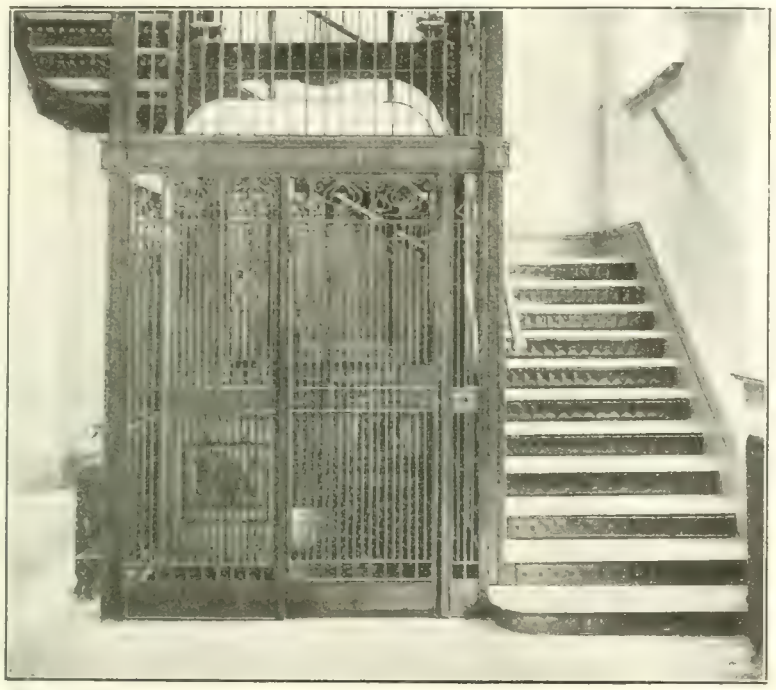

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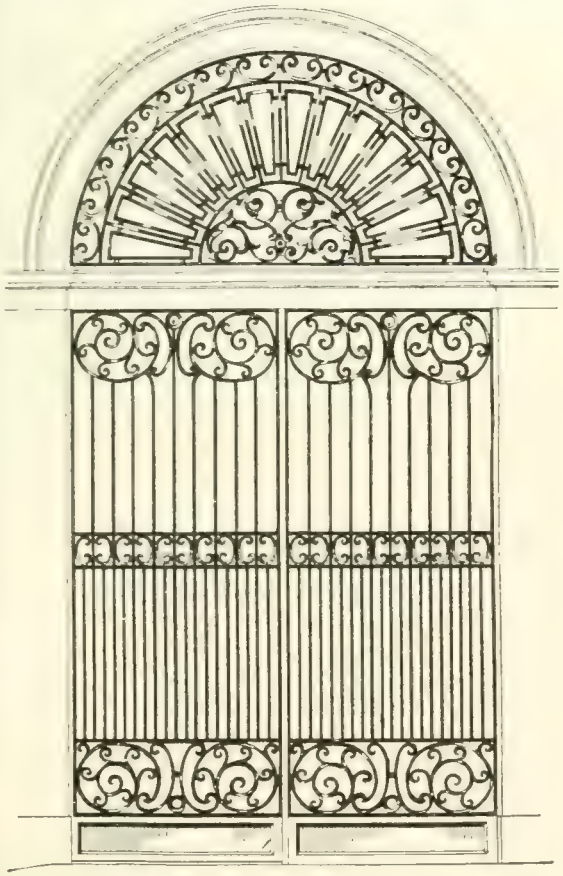

Ornamental Iron Work

We are specialists, and can give you high-class work at reasonable prices. Let us quote on your requirements

Stairways—in Wrought and Cast Iron
Fire Escapes
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Bank Counter Screens
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Balconies, Window Grills, Lamps, and Brackets
Light Structural Iron Work

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Protect Your Buildings as well as Insure Them!

Prevention of fires is vastly better than the partial redress which is all the best Fire Insurance Policy can give you. This prevention is easily secured by using

ASBESTOCEMENT Building Materials

TRADE MARK
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ASBESTOS SHINGLES

make roofs that are handsome, **fireproof,** practically everlasting and moderate in price.

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prevents inside fires from spreading. It is quickly applied, and gives a permanent, attractive, yet inexpensive interior finish.

Asbestos Corrugated Sheathing

makes walls and roofs for Garages, Stables, Barns, Warehouses and Factories, that are absolutely **weather and fire proof.**

You build for all time when you build in Asbestocement

Write for booklet "T.B." and state in which product you are particularly interested.

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ANCHOR Hardwall Plaster

is the modern solution to the difficulties and annoyances experienced by the use of the old style, soft, crumbly lime mortar.

¶ Costs no more than lime and gives a wall that is positively indestructible.

¶ Made from Alabaster or Gypsum Rock finely powdered, which, when properly treated, forms a natural cement. Water is added and cement sets even harder than original stone.

¶ Sets in two hours, whereas lime mortar takes from four to six weeks.

Numerous advantages fully explained in an attractive circular. Write for a copy to-day.

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Stair Building :: TORONTO, ONT.

Reliable Information

is given in the "Steel Square Pocket Book," by Dwight L. Stoddard.

A practical and invaluable treatise on the various methods of using the Carpenters' Steel Square.

Convenient for the pocket, size 3 x 5 ins. Contains 150 illustrations and 160 pages of expert instruction.

Directions for describing hexagons, octagons and other polygons, circles, ovals, ellipses and a host of other information.

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PATENTED AND REGISTERED.

Makes Cement Water-proof

For

Damp Walls,
Leaking Cisterns,
Flooded Basements.

The result of many years research by an eminent British chemist. The ***cheapest*** and ***only safe*** method of water-proofing cement and concrete work. Used by British Government, Foreign Governments, Architects, Engineers, Contractors, Etc., Etc., as a preventative against Damp Walls, Flooded Basements, Reservoirs, Roofs, Etc.

"We used **'PUDLO'** in a stokehole near and below head of canal. Result is, **A Good Job.**"—Ref. 63.

Pudlo increases the strength of Portland Cement.

Write for Booklet of full particulars free on request. **Agents Wanted**

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Sole Distributors for Canada

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Water Washed Sand
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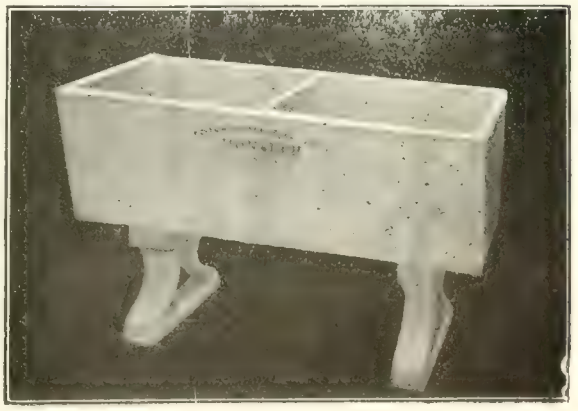

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We solicit your business—thoroughly convinced we can give you complete satisfaction in Quality, Price and Service.

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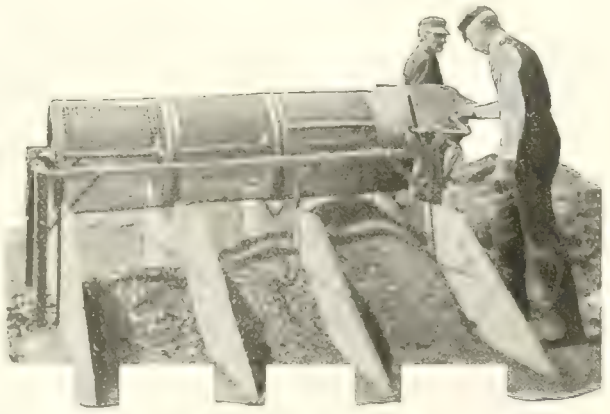

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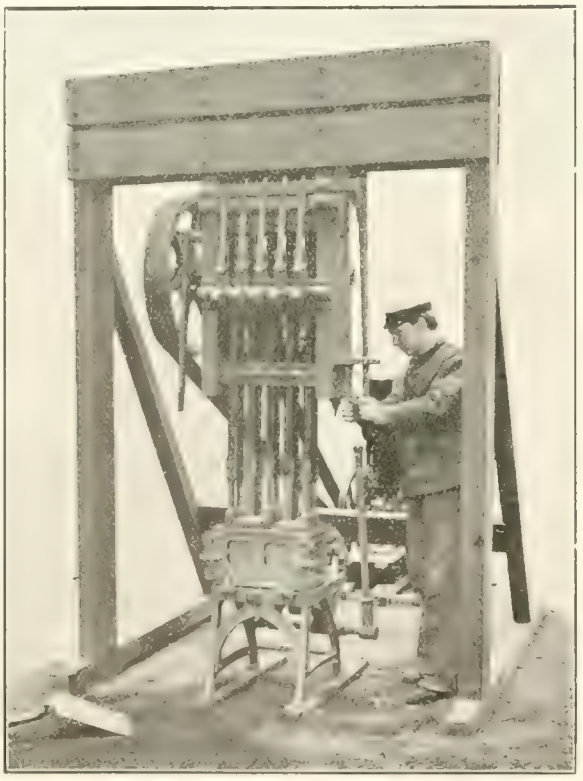

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Batch Mixer showing Folding Loading Platform.

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Block Machines, Brick Machines
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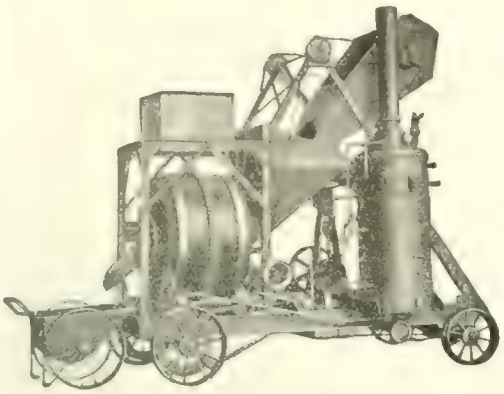

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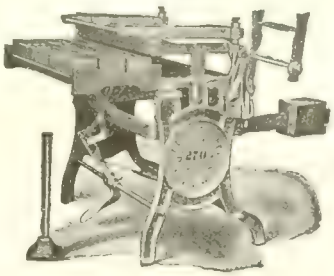
All made in our own Factory and under a system of producing an Excellence of Quality. Our large output right from Factory to the Contractor.



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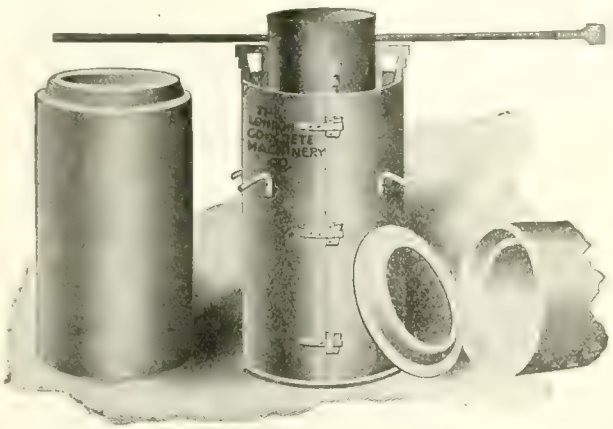
Even such remarkably low prices are preferable to exorbitant prices and small output.

Some people wonder how we can sell high-grade machinery at such low prices.

It is quite simple.



London Sewer Pipe and Tile Moulds

We manufacture over twenty different sizes and styles of

Concrete Mixers
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Concrete Block Machines
Cement Brick Machines
Cement Tile Machines
Tile Moulds
Rock Crushers
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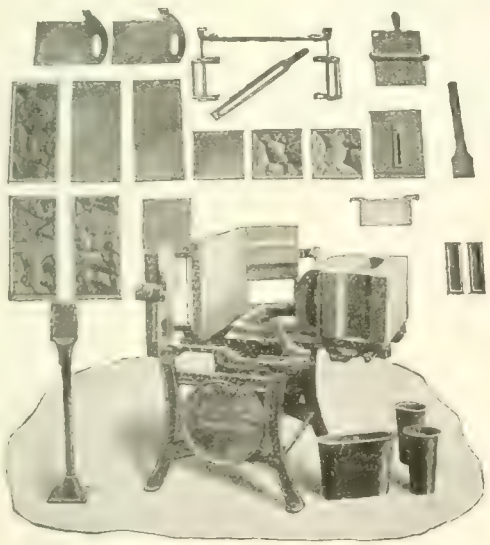

London Cement Block Machine

Our Enormous Sales and Small Profits are Sufficient Explanation

Gasoline Engines
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A Complete Line of Cement Working Tools

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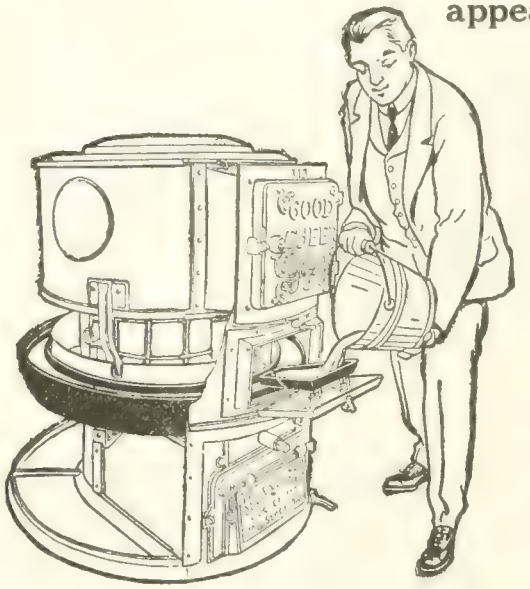
A Comfortably Heated House

appeals to everyone



In our climate, househeating is not a luxury, but a necessity, and so long as you let your heating contracts to the lowest bidder, and without due consideration of the importance of adequate heating provision, so long do you leave your reputation as a house-builder open to criticism. The slight difference in cost of

A "GOOD CHEER"
CIRCLE WATER PAN
WARM AIR FURNACE

over that of the average heater is a mere bagatelle compared to the enhanced value it gives to the house.

Let us send you our attractive Catalogue, which gives interesting information about the "Good Cheer" system of Heating. Free to Readers of this Paper.

THE JAMES STEWART MFG. CO., LIMITED
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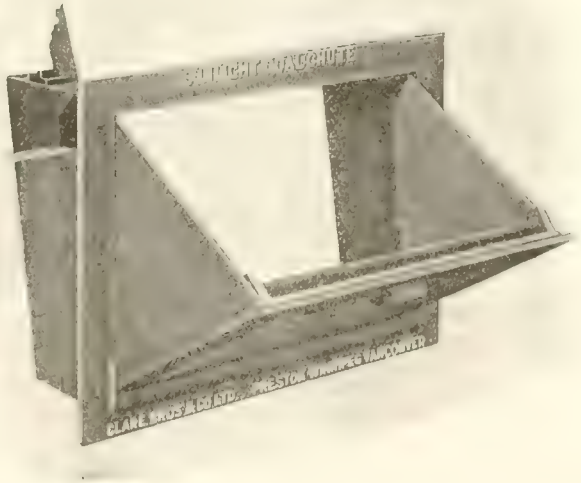

The Window Chute

is no longer a luxury but a recognized necessity in every up-to-date building.

Open—It's a chute through which fuel can be put into the basement with ease and convenience.

Closed—It's a window that locks automatically and can be opened only from the inside.

A Basement Window used for taking in fuel must be continually repainted, repaired and reglazed.

A Window Chute needs no repairs and is always neat and clean.

Prices sent on request

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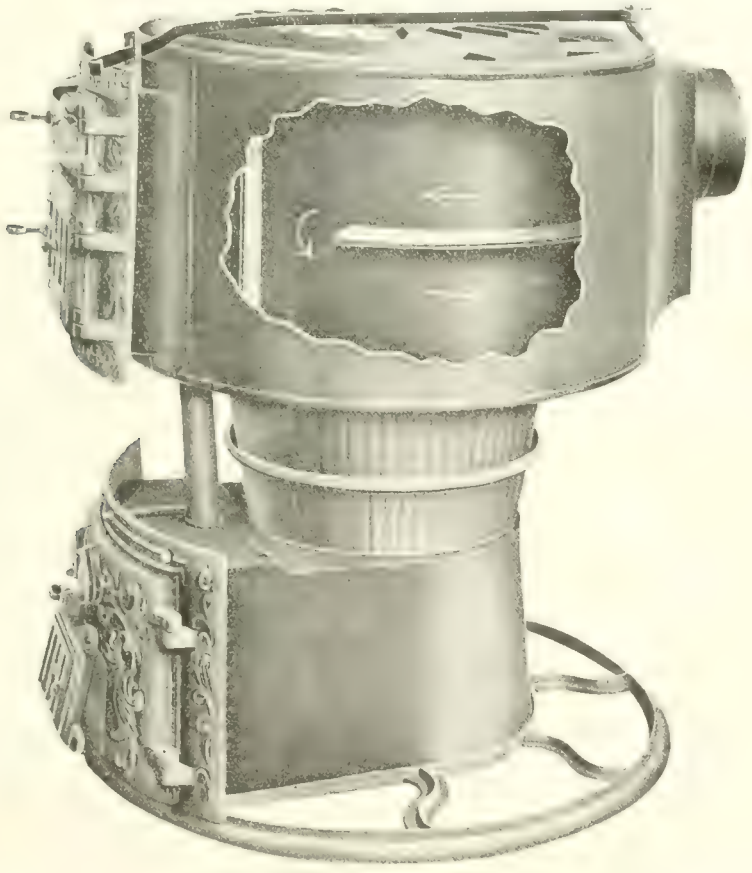
The Pilot Success Furnace

Cut Showing Special Radiator Construction



A Thoroughly Efficient Furnace

At a Reasonably Moderate Price

IMPORTANT TO THE BUILDER

It will pay you to investigate reasons for the Efficiency and Economy of the Pilot Success Furnaces. Consider the following features:—

Special Radiator Construction—gives twice the fire travel of any other furnace.

Large Air Space—Allows a quick, free and even air circulation, which prevents waste of fuel.

EXTRA LARGE FEED DOOR — Allows passage of irregular chunks of wood.

COMBUSTION CHAMBER—Large and roomy. Gives proper combustion of gases. Extra strong and durable.

DIRECT DRAFT DAMPER—Higher feed door. Effectually overcomes smoke and gas nuisance when firing.

EASILY REGULATED and CONTROLLED—without going downstairs.

Pilot Success Furnace has many other features which make it a good furnace for you to install in the houses you are building. Send for free booklet and prices.

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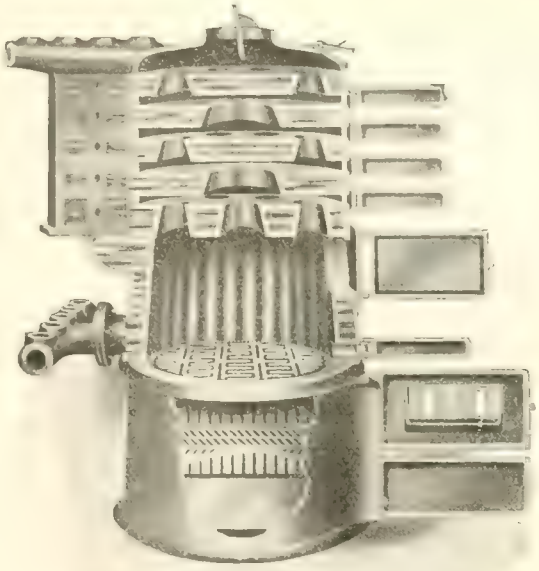

1913-1914 SOVEREIGN

Made with large flared flues. Will burn any kind of fuel—hard coal, soft coal, wood or waste material of any description.

Whether You Build to Sell or Build to Rent

After a person has looked through a house that suits them they will not finally close the bargain either to buy or rent until you have answered two more questions :

"Is this a warm house?"

"How many tons of coal will we have to burn?"

These questions will be answered to the entire satisfaction of any prospective customer when you say

"That was a 'Sovereign' boiler you saw in the cellar."

TAYLOR - FORBES COMPANY, LIMITED : Guelph

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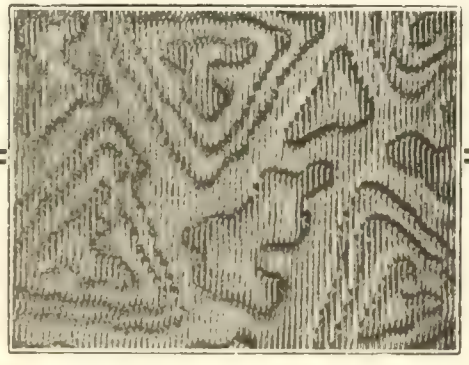
WINNIPEG—Vulcan Iron Works **ST. JOHN, N.B.—16 Water St.**
QUEBEC—Mechanics' Supply Co. **CALGARY—P. D. McLaren, Limited**



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Here's something new and very attractive to work into specifications for private houses and public buildings.

Max-Silk Figured Glass

Quite the handsomest and most attractive opaque glass in Canada. It is rolled to a semi-prism effect and may be obtained in all colors ⅛" thick. It is sold by the square foot.

Telephone or write for sample and full particulars. You will be delighted with it.

"Consolidated" stands for everything that's good in the Glass Industry.

Consolidated Plate Glass Co. of Canada, Limited

Phone Col. 8000 241 Spadina Ave.
Private Branch Exchange connecting all Departments.

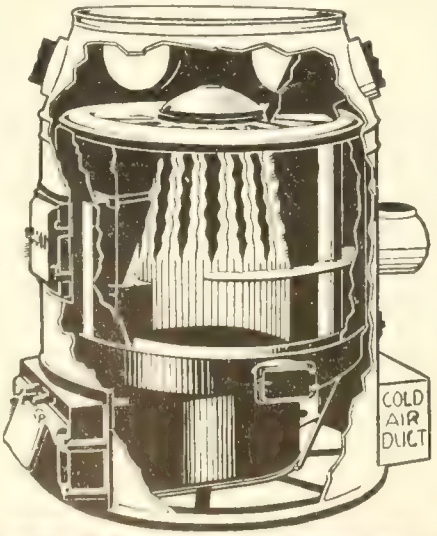
May Save the Cost of an Extra Furnace

The Kelsey Positive Cap Attachment is a new feature in warm air heating. **It directs warm air in independent currents to wherever it is wanted.**

Each room in the building gets a sufficient supply of **Pure Warm Air.**

If only a part of the building is to be heated that part gets all the heat. The fue consumption is regulated to the volume of heat required.

One Kelsey Warm Air Generator equipped with this attachment **has given satisfaction where two or more hot air furnaces had been thought absolutely necessary, or where steam or hot water heating had been thought indispensable.**



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The **Jas. Smart Mfg. Co., Limited**

BROCKVILLE
Ont.

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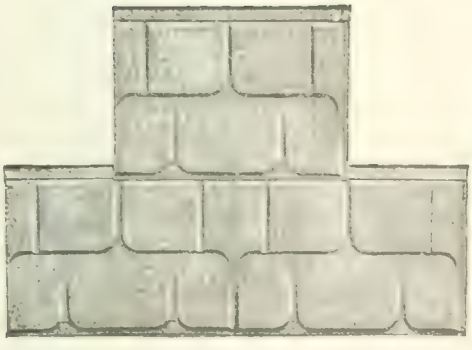
Man.

Building covered with Acorn Steel Siding and roofed with Safe Lock Shingles

Carpenters and Builders, Attention!

WE now carry a full line of Metal Roofings, Sidings, Ceilings, Plasterers' Corner Bead, Wall Ties, Wall Plugs and all Sheet Metal Goods in stock for immediate delivery to any point.

Get in touch with us at once and ask to see a sample of our new "Ideal Acorn Ornamental Ridge"



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Plasterers' Corner Bead

The A. B. Ormsby Co., Limited

Head Office: Toronto, Ontario

Associated with THE METAL SHINGLE & SIDING CO., Limited

Address nearest branch

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Staved Columns, Veneered and Balusters, Sash, Floor

Batts' Staved Columns

Our Columns have a Special *'Lock' Joint,* which prevents Staves opening, and also increases the Glueing Surface. We use only the best grade of Waterproof Glue.

Design B.L. No. 1

Lh. Dia.	5″	6″	8″	10″	12″
4 ft.	$1.60	1.70	2.25	3.00	5.00
5 ft.	1.85	2.00	2.40	3.25	5.50
6 ft.	2.10	2.20	2.50	3.40	5.75
8 ft.	—	—	3.10	4.20	6.75
9 ft.	—	—	3.50	4.75	7.50
10 ft.	—	—	3.75	5.00	8.00

Design B.L. No. 2

Lh. Dia.	5	6	8″	10″	12″
4 ft.	$1.60	1.70	2.50	3.35	5.75
5 ft.	1.85	2.00	2.65	3.60	6.25
6 ft.	2.10	2.20	2.75	3.75	6.50
8 ft.	—	—	3.35	4.55	7.50
9 ft.	—	—	3.75	5.10	8.25
10 ft.	—	—	4.00	5.35	8.75

Design B.L. No. 3

Lh. Dia.	5″	6″	8″	10″	12″
4 ft.	$2.10	2.20	3.00	4.70	6.75
5 ft.	2.40	2.55	3.20	5.50	7.30
6 ft.	2.70	2.80	3.35	5.80	7.60
8 ft.	—	—	4.10	7.70	8.70
9 ft.	—	—	4.55	8.25	9.50
10 ft.	—	—	4.90	8.60	10.05

Design B.L. No. 4

Lh. Dia.	5″	6″	8″	10″	12″
4 ft.	$2.60	2.80	3.70	4.75	8.00
5 ft.	2.85	3.10	3.85	5.00	8.50
6 ft.	3.10	3.30	3.95	5.15	8.75
8 ft.	—	—	4.55	5.95	9.75
9 ft.	—	—	4.95	6.50	10.50
10 ft.	—	—	5.20	6.75	11.00

Design B.L. No. 6

Lth. Dia.	10″	12″	14″
6 ft.	$6.80	8.85	10.60
8 ft.	8.70	9.95	11.95
9 ft.	9.25	10.75	12.90
10 ft.	9.60	11.30	13.55

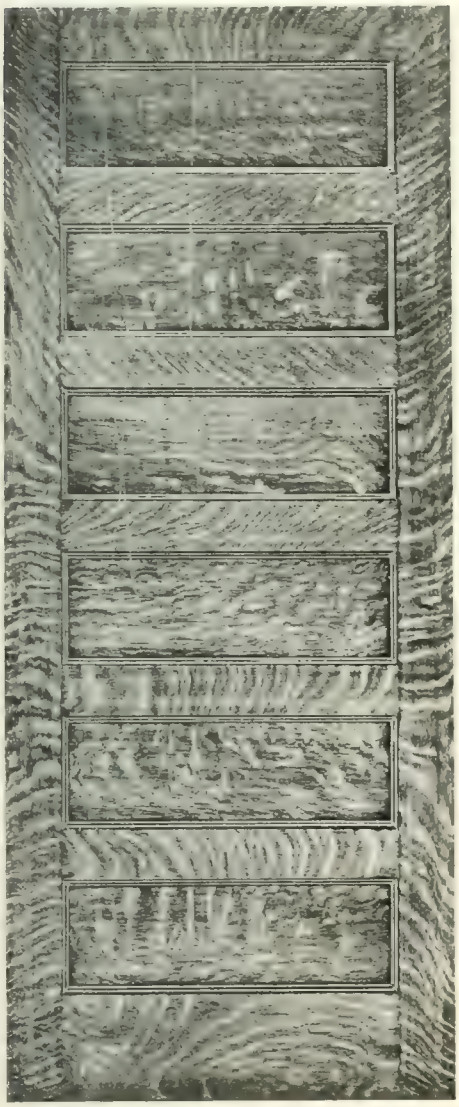
Builders allowed 10 per cent. discount on above, 8, 10 and 12 in. columns in designs Nos. 1, 2 and 3

BATTS LIMITED

Pine Doors, Newel Posts, Frames,

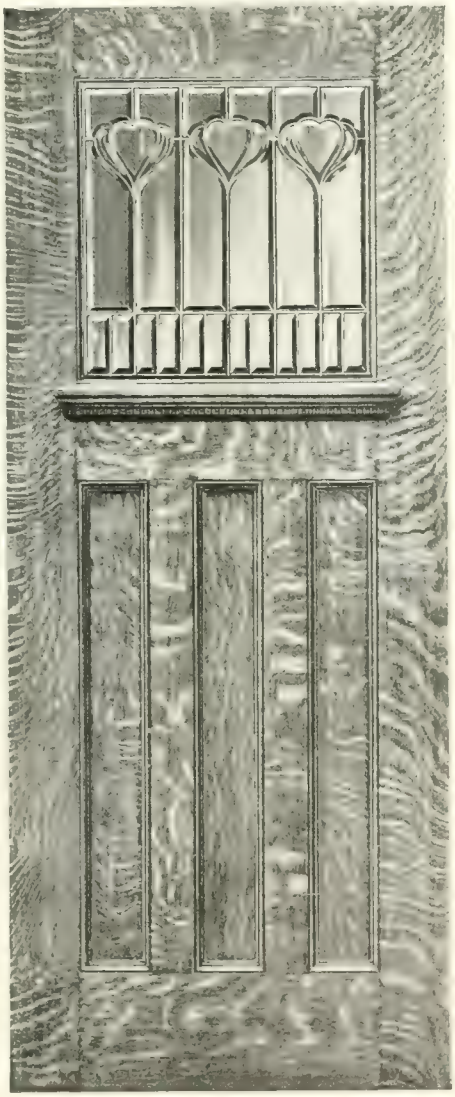
ng and in fact everything required to complete woodwork for your building

Batts' Doors are Reliable Doors at Reasonable Prices



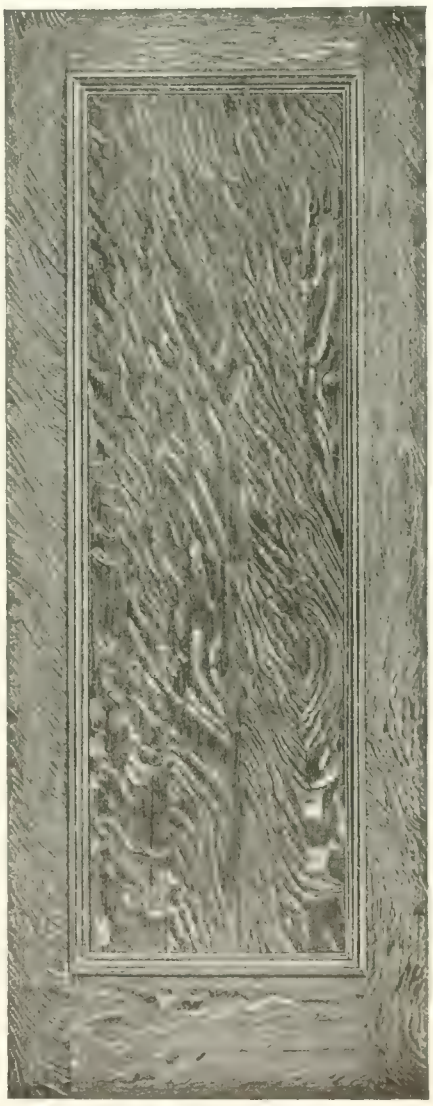
B.L. No. 301, ¼-Cut Oak

Sizes in Stock	
2 ft. 8 in. x 6 ft. 8 in. — 1¼ in.	Price $7.40
2 ft. 10 in. x 6 ft. 10 in. — 1¾ in.	Price 7.40
3 ft. 0 in. x 7 ft. 0 in. 1¾ in.	Price 7.65



B.L. No. 314, ¼ Cut Oak

Sizes in Stock	¼-Cut Oak	Pine
2 ft. 8 in. x 6 ft. 8 in. — 1¼ in.	Price $8.50	$4.00
2 ft. 10 in. x 6 ft. 10 in. — 1¾ in.	Price 8.50	4.25
3 ft. 0 in. x 7 ft. 0 in. — 1¾ in.	Price 9.00	4.50



B.L. No. 316, ¼-Cut Oak

A beautiful and high class design of inside door

If you do not see the styles of doors here you wish, send for our 1913 catalog, free to readers of The Canadian Builder

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MEDUSA
CEMENT PRODUCTS

Medusa Water-Proofing for Cement

Medusa White Portland Cement

is especially useful in making building blocks, cement plastering, cellar walls, cistern linings—or anywhere else where resistance to water is required.

Saves Money because it saves Cement we'll prove it to you

is perfectly white in color, and is guaranteed to be equal to the best gray cement in strength, setting and hardening qualities.

Especially adapted to ornamentation work, interior decoration, etc.

FREE SAMPLES OF EACH ON REQUEST

Stinson-Reeb Builders' Supply Co., Limited

10th Floor **Montreal** E. T. Bank Building

SEMI-READY HOMES

What They Are and Why You Should Use Them

THE SEMI-READY Home is a Building on exactly the same lines as the ordinary construction, **except—and the big point is this,** it is all prepared at the factory ready to erect.

Our Way

YOU send us a sketch of the style of house you want and we will then be prepared to pay.

We will make plans of what we can do for you along with a price which includes everything for your house from the foundation to the locks on the doors.

In adopting our system we save:

1. Architects' fees;
2. Retail lumber profit;
3. Retail profits on glass, hardware and paint;
4. [illegible] the freight and cost of erection.

How do we manage this? Because we handle the lumber from the log to the people. We are wholesale agents for glass, hardware and paints, and import them in large quantities. We will ship a house of average size in ten days from date of order. Should you decide not to build after we have prepared special plans for you we will charge you a fee of $10.00 for the plans.

The Other Way

YOU decide to build and employ an architect to draw plans and get estimates and this will cost you 5 per cent. of the cost of the house. You then on your estimate have to pay wholesale and retail profit on lumber and other materials as well as a profit of 10 per cent. to your contractor on same.

You have the worry of arranging and dealing with several firms such as the carpenter, painter, glass merchant, hardware merchant and the architect.

It has been proved by everyone who has built a house or building of any kind that the estimates are usually exceeded by twenty-five or thirty per cent.

The principal worry is that, having so many contractors to deal with—your house usually takes from six to twelve months to build.

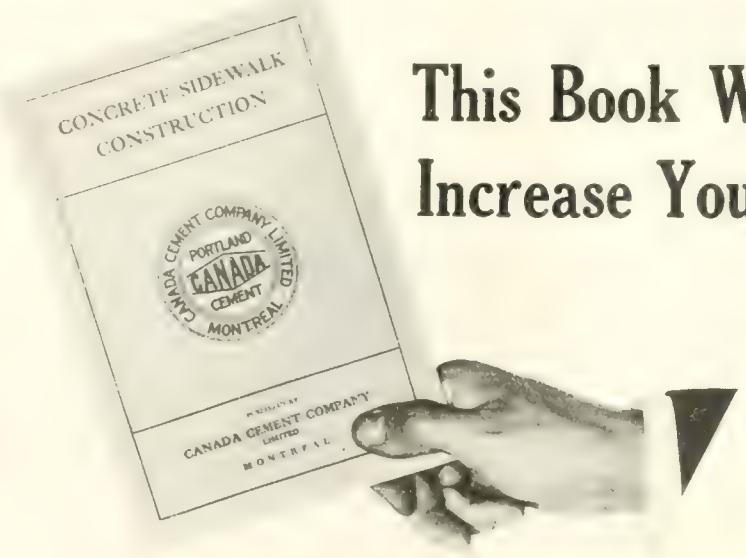
MORAL: **Better to deal with one firm who can save you time, money and worry, and who are specialists in this particular business.**

We are Specialists in

Planing Mill and Interior Fitting Work of all kinds, including sash, doors, panelling, stair work and everything pertaining to a building, from the lintels of the basement to the buffet in the dining room.

See our representative at 709 Kent Bldg., Toronto or write to us

H. M. Lickley, Limited, GRAVENHURST Ontario



This Book Will Help Increase Your Profits

THERE are many ways in which concrete can be used to improve city or country properties. One of the first things a man wants around his house is a suitable walk.

¶ The most satisfactory, most economical and best appearing walk is made of concrete. It is clean, sanitary, safe and permanent.

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Canada Cement Company Limited

Montreal

Elevation of a pair of brick houses on Page St., Toronto

A $4000 Brick Semi-Detached Seven-Room House

It shows what can be done in the conservation of space

BY GORDON C. KEITH

ONE of the greatest troubles of a Canadian builder is to get his ideas into plans suitable for narrow lots. Where ground is expensive, the conservation of space is necessary. In the growing cities and towns the man on salary cannot afford to pay the upkeep costs of a large plot of ground and must content himself with a house designed to give all the conveniences possible on as little ground as will allow the house to be constructed. The majority of houses are of this nature.

The books published giving plans of houses very seldom give any ideas for this style of house. The following article which deals with a semi-detached house erected on a lot about 23 ft. should therefore be of interest. In the house, every corner is made use of, the idea being conservation of space. There are a number of good ideas which may be used to advantage by builders erecting this class of house. Not only that, but a study of the plans may suggest new ideas which may be incorporated in new plans of narrow lot houses.

The Front Elevation and Proposed Improvements

Messrs. L. D. Sykes and R. J. Knox, 429 Brock Ave., Toronto, are erecting on Page St., Toronto, two pairs of brick houses to cost about $4,000 each. An idea of the front elevation may be had by a reference to the photograph shown in the heading. It will be noted that there is a little difference between this elevation than that shown in the line drawing.

A bay window has been placed in the centre of the pair of houses and the dividing wall is in the centre of the bay window. Mr. Knox stated to the writer that while this looked all right on the outside, it made an odd-shaped room on the first floor, and in future, if he used this design, he would either use the line drawing shown or else put a small bay window in each house. This would be a great improvement, especially if the owner of one house decided to paint his house a little different from his neighbor.

Foundation and Basement

The houses are each 20 ft. x 33 ft. 6 ins., with a 3 ft. entrance at the side. A side door gives entrance to either kitchen or basement. The stone walls are 16 ins. in thickness. The floor is of concrete and well drained. The equipment consists of permanent tubs and McClary's hot air "Radium" furnace.

At the side of the door is a wall cupboard which may be opened on both the inside and outside. This is for the delivery of bread, milk, etc., and is an improvement much appreciated by the housewife.

Ground Floor Layout

At the front door is a verandah about 8 x 10 ft. Hardwood floor has been laid in the hall, parlor and dining-room. In the east house of the pair shown in the illustration is a coal mantel of mottled brick, and in the west house, a gas mantel.

Between the dining-room and parlor is an arch. In the dining-room is a plate rail in keeping with the other finish of the house. Georgia pine in natural color is used throughout the house, and doors and windows are completed with mantel trim.

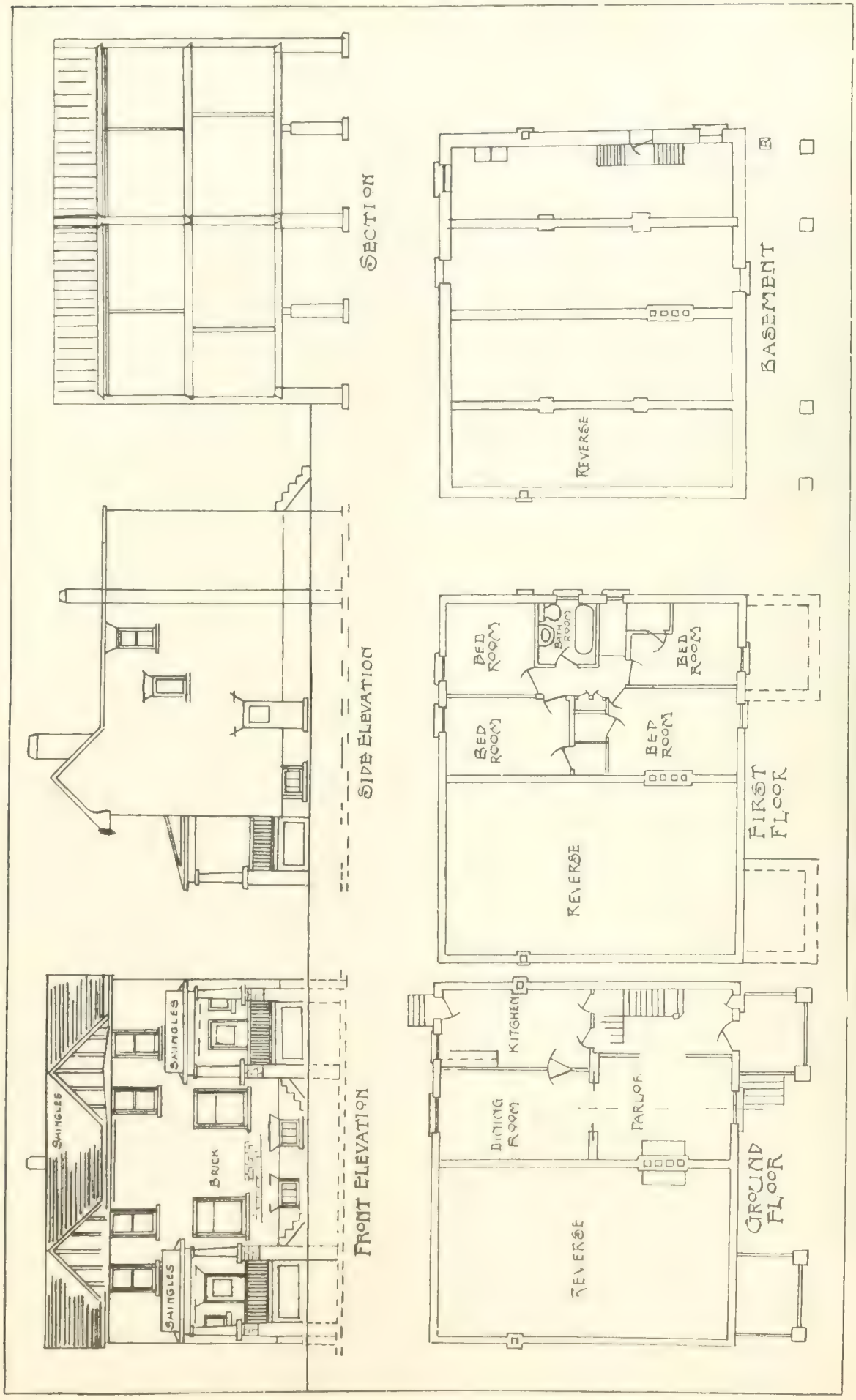
The Kitchen Cupboard

There is no pantry in connection with the kitchen, but taking its place is a cupboard of very handy design. It is shown in Fig. 3 and is so constructed that provisions may be placed on the table-shelf and lifted to the dining-room table without carrying them around through the door. This cut appears on page 36.

On the dining-room side of the table-shelf is a panel that drops like the leaf of a table. Below this shelf is a space for drawers which may be drawn to either the kitchen or dining-room side as desired. Below and above these two shelves, the doors open to the kitchen only.

A feature of the cupboard is the flour bin, which is shown open. It is hinged at the bottom and is equipped with stops so it will draw out as far as the width of the top, which is wider than the bottom. The design is the shape of a wedge. The bin is divided into two parts and may be used for two kinds of flour or for flour and sugar, etc.

At the right hand side of this bin are shelves for pots, pans, etc. At the rear of the kitchen a closed-in


SECTION
SIDE ELEVATION
FRONT ELEVATION
SHINGLES
SHINGLES
BRICK
SHINGLES
BASEMENT
REVERSE
FIRST FLOOR
BED ROOM
BATH ROOM
BED ROOM
BED ROOM
BED ROOM
REVERSE
GROUND FLOOR
KITCHEN
DINING ROOM
PARLOR
REVERSE

entrance has been built instead of only steps as shown in the plan.

The size of the rooms are about as follows: parlor, 12 x 15 ft., dining room, 10 x 16 ft., and kitchen, 8 ft. 6 ins. x 16 ft.

First Floor Layout

It will be noted that the stair occupies a minimum of space, the cupboard in the bedroom at front having a closet with an elevated floor over the stair "head room." All the bedrooms are supplied with ample cupboards, except the one back of the bathroom.

The size of the rooms on the first floor is about as follows: [illegible] x 12 ft.; 9 x 14 ft.; 8 ft. 6 ins. x 13 ft., and 9 ft. 6 ins. x 10 ft.

At the head of the stair is a casement window. The bathroom is equipped with a three-piece set and medicine cupboard.

A study of the plans will show that it has been designed to save waste of joists. The elevations are:—basement, 6 ft. 6 ins.; ground floor, 9 ft. and first floor, 8 ft.

The Minimum Height of a Profitable Office Building

In large cities where land is of great value the modern skyscraper must indeed be cloud-soaring if it is to yield a profit. In a paper recently presented by Mr. C. T. Coley, before the National Association of Building Owners and Managers, an illustrative problem was solved, showing a minimum profitable height of 35 storeys for an office building in New York. We have arranged Mr. Coley's data (omitting none) and calculations so as to condense them as far as possible, thus:

Assume:	
Value of land, per sq. ft.	$300
Interest, per cent.	5
Taxes on full value, per cent.	1.83
Per cent. of land area covered by building (the remainder for light courts)	95
Per cent. of building area not occupied by elevators, walls, columns, etc.	65
Per cent. of revenue earning ground area, 95% x 65%	61.75
Annual interest and taxes pers q. ft. of land area, 6.83% of $300	$20.49
Annual interest and taxes per sq. ft. of rentable land area, $20.49 ÷ 61.75%	$33.23
Distance between finished floors, feet	12
Per cent. of floor area rentable	65
Number of cubic feet of building required per sq. ft. of floor area, 12 ÷ 65% =	18.5
Cost of building, per cu. ft.	$0.80
Building cost per sq. ft. of rentable floor area, 18.5 ÷ $0.80 =	$14.80

The annual cost of the building per square foot of rentable floor area is as follows:

Fixed Charges and Losses.	Cost per sq. ft.
Interest, 5% of $14.80 =	$0.74
Taxes, 1.83% of $14.80 =	0.27
Depreciation fund (50-year life)	0.30
Loss of rent, 10% of $3.50 rental price	0.35
Total fixed charges and losses	$1.66
Cost of Maintenance and Operation:	
Engine room labor, supplies and repairs	$0.18
Coal (including ash removal)	0.15
Elevator labor, supplies and repairs	0.09
Janitor's labor and supplies	0.15
Electrician's labor and supplies	0.02
Supervision and collections	0.09
Building repairs (1%)	0.15
Insurance (0.1%)	0.015
Water	0.025
Sundries	0.01
Total annual cost of building	$2.54

Since the annual rental is assumed to average $3.50 per square foot of rentable floor space, there is a profit of $3.50—$2.54=$0.96 per square foot, which must at least suffice to pay the annual interest and taxes on the land. But, as above shown, the annual interest and taxes on the land amount to $33.23 per square foot of rentable land area, i.e., land over which there is a rentable floor area. Hence we have 33.23÷0.96=34.6 storeys.

Therefore the building must be at least 35 storeys high if it is to pay all annual costs of land and building, under the assumed conditions. It must be higher than 35 storeys in order to show a profit above bare interest on the investment.

In studying Mr. Corey's figures we note an error in the allowance of 30 cts. per square foot of rentable floor for annual depreciation. This is a little more than 2 per cent. of the cost per square foot of rentable floor. But a sinking fund drawing 4 per cent. (as assumed by Mr. Corey) would redeem the entire investment in 28 years (instead of the 50 years assumed by him) if the annuity were 2 per cent. of the first cost. In fact an annuity of 1 per cent. of the first cost will redeem the entire first cost in about 40 years if the fund compounds at 4 per cent.

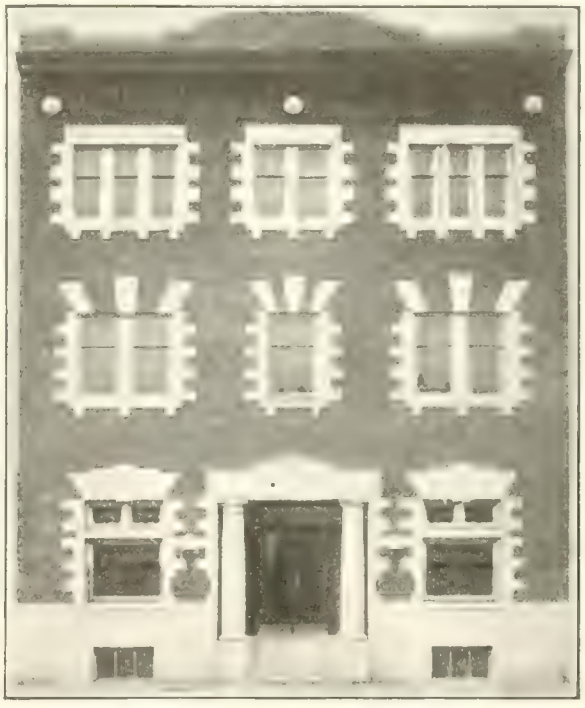
It will be noted that Mr. Corey estimates about 1 per cent. for current repairs on the building in addition to the depreciation annuity.

The assumed cost of the land, $300 per square foot, is enormous, being in excess of $13,000,000 per acre. The assumed cost of the building, 80 cts. per cubic foot, is also very high. Evidently, however, the total volume of the building upon which the 80 cts. is estimated does not include the non-rentable basement. The 80 cts. includes all equipment, such as boilers, engines, elevators, etc., but, even so, this cost is very high.

In estimating taxes on land and building, the two following items should be allowed for: (1) the tax rate (expressed as a per cent. of the value) applies to assessed value, which in many cities is only 50 to 60 per cent. of the actual value; and (2) the "actual value" of a building is usually taken to be its depreciated value, and quite heavy rates of annual depreciation are commonly estimated.

In Mr. Corey's annual rental estimate of $3.50 per square foot of floor, it is to be presumed that he has allowed for the very high rental which is received for the ground floor. The first floor below the street level also usually commands a high rental.

In order to convert some of Mr. Corey's unit-cost figures to totals per annum, let us assume that the building covers 10,000 sq. ft. Then, 6,500 sq. ft. × 35 (the number of storeys)=227,500 sq. ft. of rentable floor. Hence, at the rates assumed, the total annual cost of maintenance and operation would be 227,500 × $0.88=$200,200. The coal alone would cost 227,500 × $0.15=$34,125 per year. The elevator service would cost $20,475, and the janitor's service would cost $34,125 per year. When thus expressed as totals, several of the items seem to be excessively high.



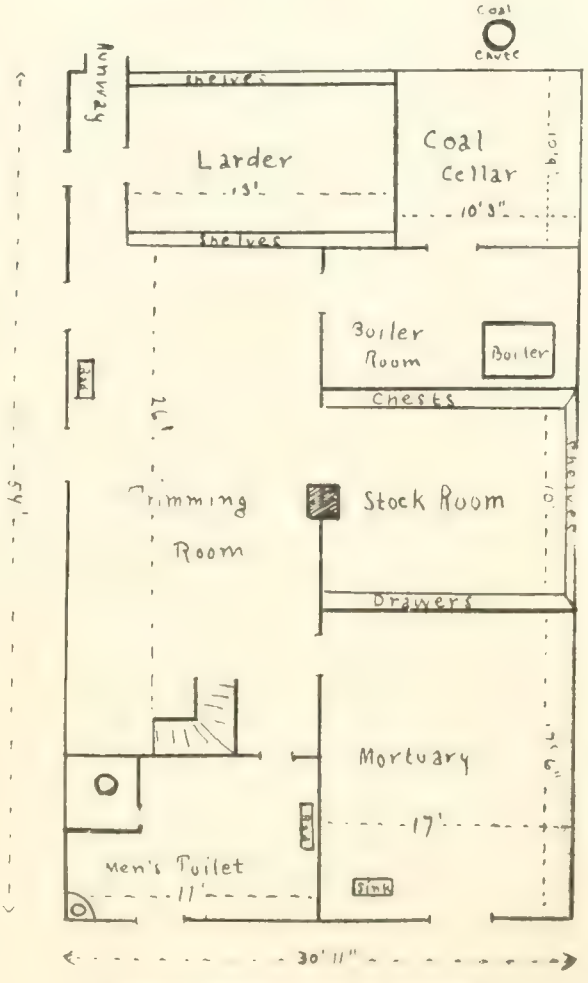
Front elevation Arthur W. Miles new undertaking parlors, Toronto

A Modern Undertaking Building

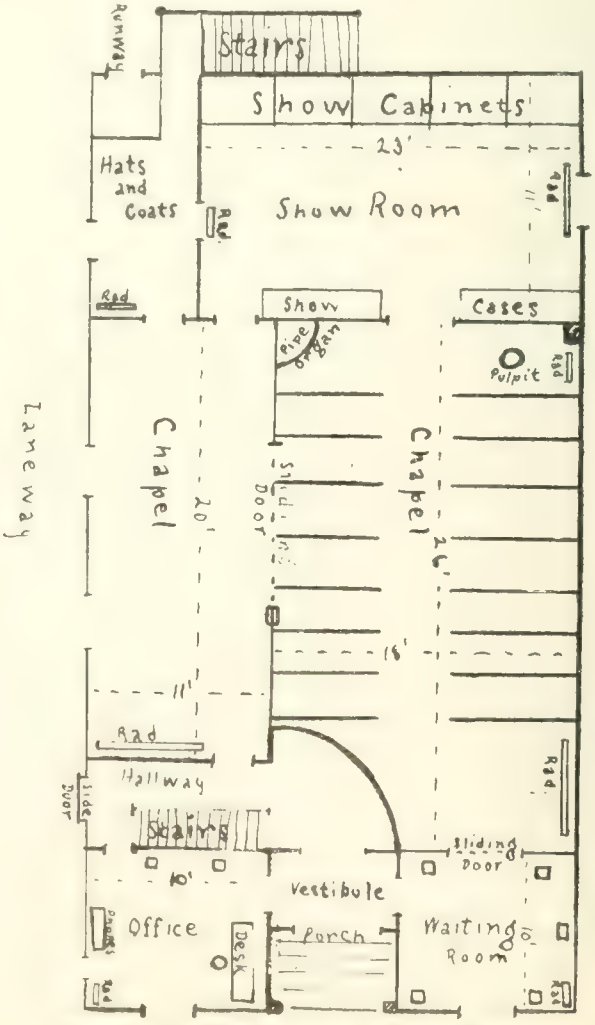
One of the finest undertaking establishments in Canada is that of Arthur W. Miles, at 396 College street, Toronto. From the standpoint of convenience, comfort, economy and taste the parlors and the building itself are in the first class.

The building is a four-storey structure, in size 32 feet by 54 feet, although the property covering stables, coach house, etc., has a depth of 140 feet. The building is constructed of Etonia pressed brick—a yellowish colored hard-burned pressed brick—with freestone trimmings and windows, doors and extremities, and cost about $16,000. The brick and stone front is relieved and embellished also with a copper top-piece, iron trellice work about the lower windows, and electric globes below the roof and on either side of entrance.

Interiorly the finishing is all done in fumed oak. The furniture and furnishings being of the same material. This oak gives the rooms a tasty appearance, and in the chapel where the wainscoting and panelling are carried higher than the other parts of the building the effect is very church-like.



Ground floor plan, showing arrangement of various offices and rooms



Ground floor plan, showing arrangement of various offices and rooms

How Hamilton Built a Brick House in a Day

A full description of the house is given, with a list of those who supplied the material.

FOR some time before the Centennial celebration recently held in Hamilton, Ont., Ald. Bryers of that city announced that he would build a house in one day (24 hours). Most people who heard of it doubted the statement, but, in spite of doubts and other set backs, the task was accomplished.

The event was billed to start on the afternoon of August 12. At three o'clock on that day, there was not a single article of material on the grounds; the site was not staked out. At 4 o'clock, the material started to arrive and was placed in convenient positions to facilitate labor. Then came the workmen and, as each arrived, he was fitted with a pair of overalls donated by one of Hamilton's merchants.

The first sod was turned at a quarter to five, and the building five hours later was up to within a few feet of the second storey. The house is equal to the average eight or nine-roomed residence. It is of two storeys, and the completion of the house included every detail of steamfitting, plumbing, finishing and furnishing.

As the workmen were at work all night, arc lights were strung on poles around the building. There were at midnight between 300 and 400 men at work. The carpentering went on simultaneously with the bricklaying, and, as concrete mortar was used, a concrete mixer was kept at work.

Dimensions of House

The building is 34 x 36 ft. outside measurements, and may properly be called a four-storey house. It contains a basement, first and second floor, and finished attic. The roof is Gothic in design, and the general architecture of the building is anything but simple. The foundations are cement, with brick facings, the upper portion of the building proper being solid brick. Everything in the house from start to finish is the best to be had, all materials used being first grade, and in many instances, extra fine. The house contains in all, nine rooms. The rooms are large, with high ceilings, and every room is finished in handsome trim.

The Inside Finish

The dining-room is panel finish with beam ceiling. The entire downstairs is finished in fumed oak, the upstairs in fumed oak and mahogany. Hardwood floors, narrow strip, both upstairs and down, with beautiful stairway of fumed oak finish, are there. The house is double-coat plastered in hard white plaster paris finish all through, and three coats of quick dry paint covers all outside parts. The doors are low panel, with fancy glass reaching almost to the floors, while the windows are large, the upper windows being fancy colored glass of very pretty design. The building is hot water heated throughout, with gas instantaneous hot water heater in the basement connected for use. The electrical connections and fixtures are of the highest grade, and the three-piece bathroom, with marble basins, bath and toilet, is also equipped with an up-to-date shower bath. Every bedroom is supplied with roomy clothes closets.

Quick Work in Plastering

Some idea of the rapidity of the work may be gathered when it is understood that the plasterers, using special prepared quick drying plaster, applied their first trowel of mortar at 12 o'clock noon, Wednesday, and at 2.30, just two hours and a half later, every room in the building, including clothes closets, was finished with second coat, hard white enamel finish, in every way just as pretty and just as well put on as is usually the case where several days are taken for doing the same work.

Beautifully Furnished

Every room is furnished beautifully, not a single detail being overlooked. The furniture, carpets, curtains, draperies, even to the attic, were the last word in house furnishing, and proved a surprise to the large crowds who inspected it.

Those Who Supplied Material

The house is hot water heated throughout, the boiler being donated by the Hamilton Stove and Heater company, and the Vici radiators were supplied by the manufacturers at a nominal figure. Pratt & Lambert donated the varnishes, stains, paints, oils, putty, etc., and the Crown Gypsum Company donated the plaster.

The eight roomed house furnished, wired and plumbed ready to live in. It took the speedy builders 26 hours

which was specially prepared for quick drying and, at the same time, giving a hard, smooth surface. The Hamilton Pressed Brick Company donated 10,000 bricks, and the Kent-Garvin Company donated the mantels and tiles and their workmen installe dthem. The Hamilton and Toronto Sewer Pipe Company donated the flue tiles, and the Penn Hardware Company donated all the hardware. The Standard Sanitary Company donated the plumbing fixtures. The Laidlaw Bale Tile Company donated the nails, the shovels were donated by the Canadian Shovel and Tool Company, and the Atkins Saw Company donated a number of saws. Culley and Breay donated the handsome electric fixtures, and their electricians did the wiring. The Payne Lumber Company, of Oshkosh, Wisconsin, donated the doors. Charles Drew donated the eavetroughs, and his tinsmiths put them up, and the Armstrong Supply Company donated the cement. L. R. Tobey donated 200 pairs of overalls.

Enamel Brick

Aristocrat of Facing Brick Gaining Popularity in America and Across the Sea

By George E. Walsh

In cities where the atmosphere is soot-laden, the artistic and utilitarian value of enamel brick for facing buildings and light courts has been amply demonstrated. The sanitary value, however, is but beginning to receive recognition. In London, Eng., the municipal authorities have passed an ordinance compelling their use in alley and courts of a certain restricted width, claiming the glazed surfaces do not absorb or retain the impurities of the atmosphere.

In hospitals, public lavatories, subway stations and slaughter houses their use has become custom, and their actual sanitary value has been capitalized, in a way, by builders of "tax payers"—one-storey structures in neighborhoods where land values are high and store rentals in good proportion—but where the owners want to hold the property practically unimproved, for some years. In cases of this kind, the fronts are faced with enamel brick and leased at enhanced rentals for meat-markets, "delicatessen," high-grade groceries and florists' shops. Here the actual sanitary value is small, but the impression of absolute cleanliness within is given by the glistening whiteness without.

In the early history of the industry were many failures. The attempt to burn the enamel on a red clay body proved disastrous, and it was not until the manufacturers had abandoned the soft glazes and, by burning the hard enamels on light buff, fire-clay bodies, that our brick were a commercial success. Once started on the road to popular favor, the manufacturers vied with each other in producing varied color effects which are becoming so popular.

There is, however, always "a fly in the ointment," and in this case the offending "musca domestica" is the unskilled labor—that is, unskilled in the laying of enamel brick—that is necessarily employed in brick laying. For this reason, the practice of guaranteeing enamel brick not to craze or crack in the wall has proven a hardship on the manufacturer, since he has no control over the method of laying, and knows that improper workmanship will result in unsightly spalls and patches, for which, although he may shoulder the blame, the man who made the brick is in no way responsible. Various attempts have been made to secure the adoption of a standard set of setting specifications, and to limit guarantees to work that has been set under these specifications and unde proper inspection, but so far this has been impossible.

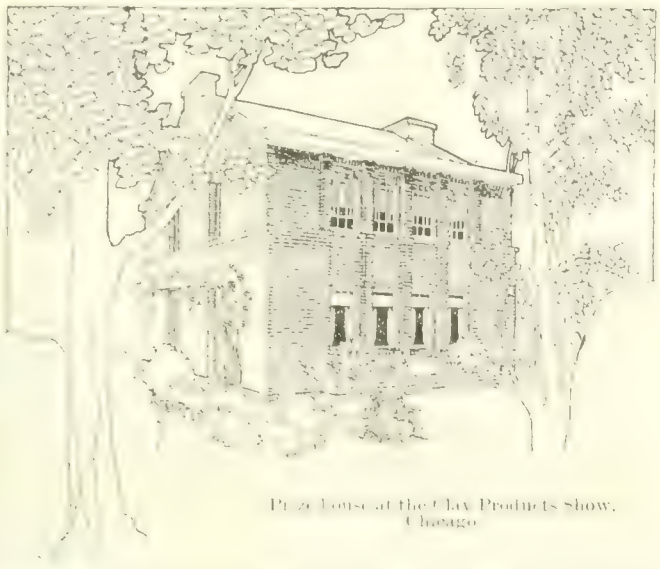
As in facing brick, various standard sizes have been adopted in enamel, but the number of sizes is greater and the number of different moulded brick much larger. Where pressed brick is made in standard (8 in. x 2¼ in. x 4 in.), Roman (12 in. x 4½ in. x 4 in.) and Norman (12 in. x 2¼ in. x 4 in.), enamels are made in "American" size, which corresponds to the "standard" in pressed brick, "English" (9 in. x 3 in. x 4½ in.), "Roman," which is the same as the pressed brick Roman and Norman, which is the same as the pressed brick Norman. But in enamel brick, they make "flats," which are either Roman or Norman size, enameled on the bed, so giving an enamel surface 4 ins. by 12 ins.

In fancy shape brick, the number that must be made to carry the enamel brick into the market is out of all proportion to real necessities, and enamel catalogues of to-day look very much as did the booklets issued by pressed brick makers twenty years ago. It is to be hoped that this expensive and unnecessary feature of manufacture will be gradually relegated to the snows of yesterday, to join the fancy moulded shapes in pressed brick.

As in facing brick, there exists a wide difference of opinion as to the relative merits of dry-press and stiff-mud in the manufacture of enamels. For the former, it is claimed that the dry-press body, being more perfect in shape, gives a surface that will take the enamel perfectly and, at the same time, let it flow on a plane that is so accurate, that the finished product will be as smooth as a pane of plate glass. The absorption of the dry-pressed "biscuit" has been overcome by the use of an underglaze of an impervious and opaque material, that protects the transparent glaze from any discoloration that might enter the body of the brick either from the backing up wall or through the joints. On the other hand, the plants that use the stiff-mud process claim that, by burning the biscuit and the enamel at one time, a more perfect bond is formed between the two and a more lasting product insured.—Brick.

When you find a machinery house that insists on a good price for its machines, you are generally safe in assuming that it furnishes a good article.

Group of parliamentary and department buildings, Ottawa.



Prize House at the Clay Products Show, Chicago

A Prize Six-Room Brick House

Cost, exclusive of heating and plumbing, $2175

Architect:
WALTER BURLEY GRIFFIN

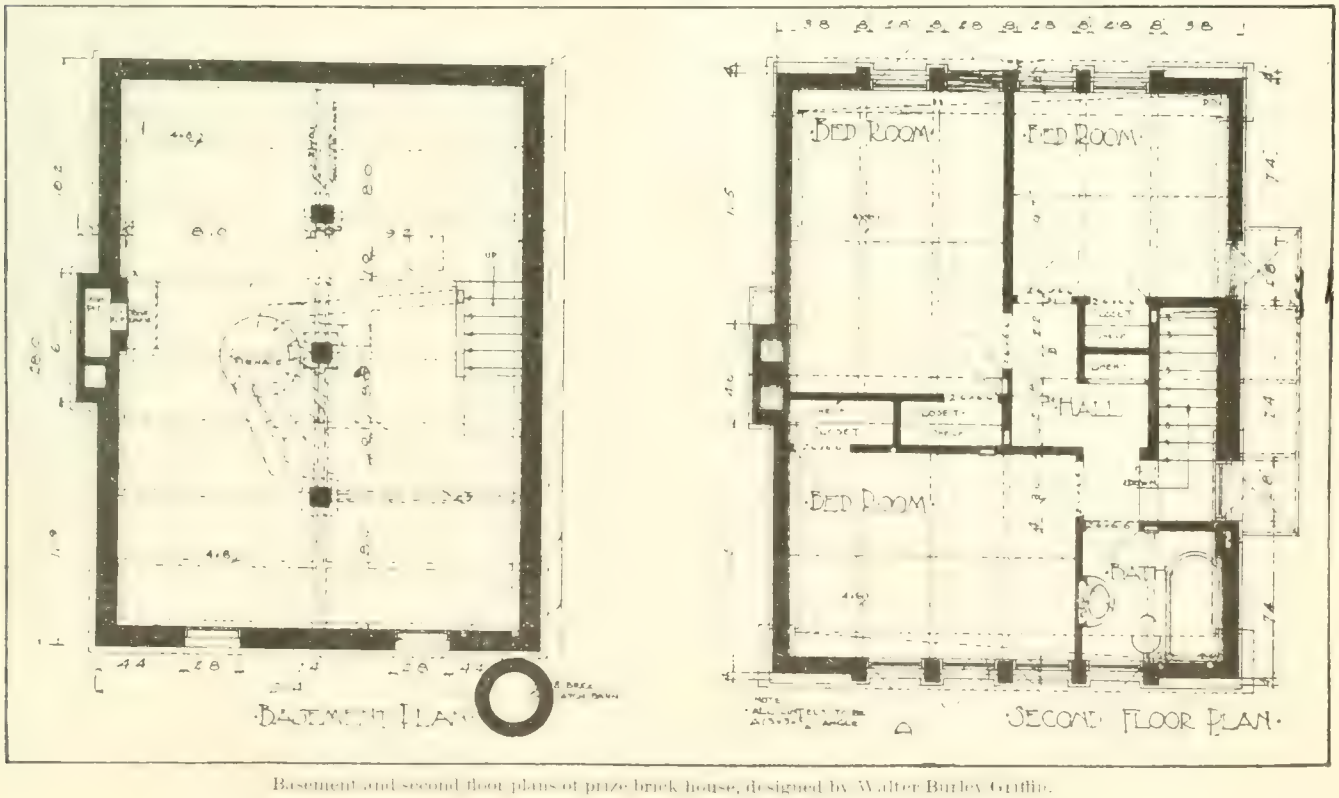
ONE of the attractions at the convention of Clay Products Manufacturers, Chicago, a few months ago, was the brick house with tile roof, erected with bricks sent by parcel post. This house was designed by Walter Burley Griffin, and won the 1913 Clay Show prize. This prize house was given to the one guessing the nearest number of marbles in a jar. The winner of the house was John Milligan, 400 Webster Avenue, Chicago, who declared there must be about 5,377 marbles in the jar. This proved to be the exact number.

This house will be erected in Chicago at a cost of $2,175, this price including everything but the heating and plumbing fixtures. Piping for gas and water will be put in the walls, however. Mr. Griffin estimates that the heating and plumbing fixtures will cost between three and four hundred dollars, so that the total cost will be $2,500 or less.

Layout of the House.

The house contains six rooms, with a living room, dining-room and kitchen on the ground floor, and three bedrooms and a bathroom on the first floor. The entrance door opens direct to the living room, and the dining-room is reached through the living room. The house is about 21 x 28 feet, with a living room of about 18 x 12 feet, a dining-room 9 x 12 feet, and a kitchen 9 x 9 feet.

The stair to the first floor leads from a corner of the living room at the left of the main entrance. The



Basement and second floor plans of prize brick house, designed by Walter Burley Griffin.

bedrooms are about 9 x 9 feet, 9 x 14 feet, and 12 x 9 feet respectively. Each is provided with a closet, and there is a linen closet in the hall.

Beamed ceilings have been adopted throughout the whole plan, every room having a ceiling of that construcion.

The Lime Finish on Plaster

By Plasterer

Reports from the country districts show that the use of plaster is extending out among country people in localities where heretofore it was hardly used at all. Down in the south country where lots of ceiling was formerly used they are now using plastering in great quantities and find that it gives much better satisfaction.

From there and from everywhere nearly, however, there comes complaint about the lime finish on plaster, of pitting and powdering off from the face. Sometimes this is accomplished by one unique explanation and sometimes by another, but there is really a plain, simple, straightforward explanation of it all.

The explanation of it is lack of thorough hydration of the lime before the finish is applied. The plasterer gets in a hurry and delays slaking his lime and fails to give it time enough for every particle to thoroughly slake, then when he applies this lime finishing coat and it dries out, here and there fine particles of lime that have not yet taken up their share of moisture absorb moisture either from the wall behind them or from the atmosphere and swell, thus causing pitting and what in the wood working world would be called "powder post."

In other words, there will be powder of lime dusting around the floors. Sometimes examination will show noticeable pitting in the walls and at other times the pitting is so fine that it is not noticeable to the naked eye, but we see the results of it in the powder and lime around on the floors.

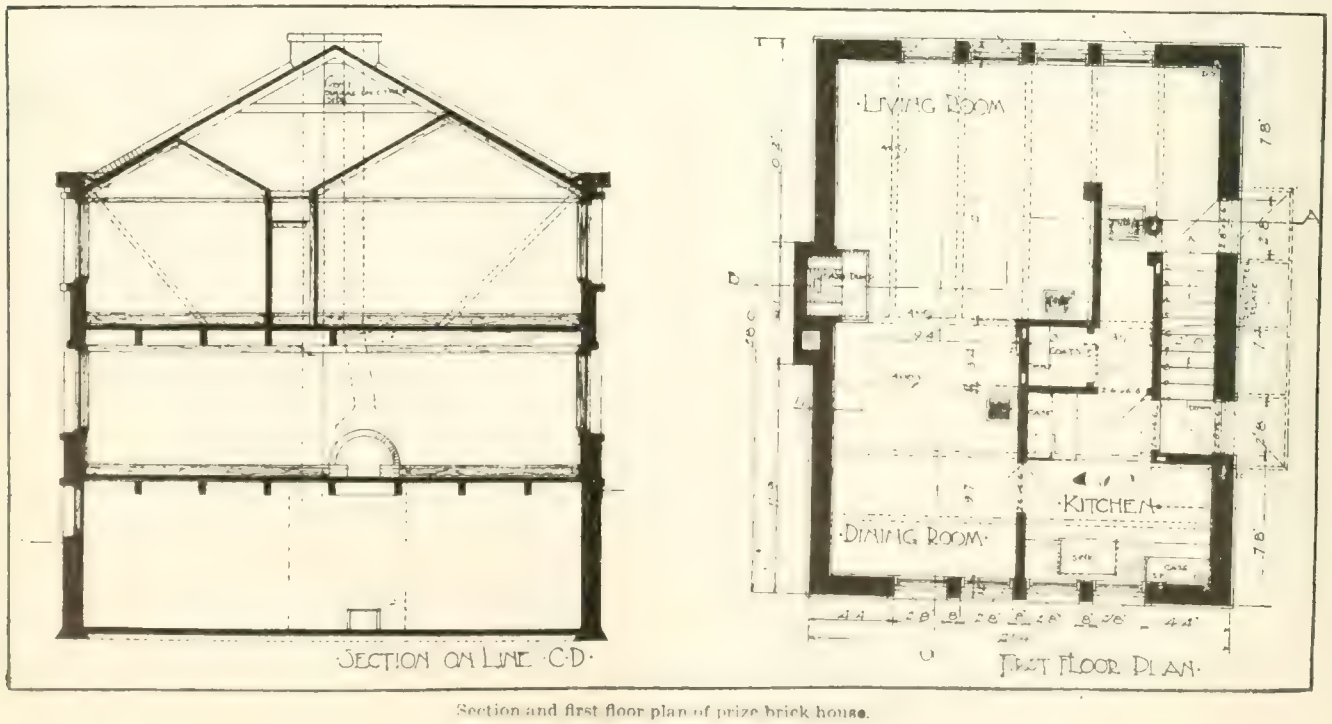
This is a matter that does not merely concern the plasterer, it concerns the reputation of the contractor and builder and should be looked after. We have made a wonderful improvement in the body of our plastering work in the past decade, so that the plastered wall to-day is much superior to the old plastered wall, and for that matter the finish is often better too, but it is not as good as it could be made by proper care.

We have reached the day of critical finish. The discriminating public wants a plastered wall that will stand tinting or painting and not have to be covered over with paper to get a nice appearance. They may want to paper them, but not always, and a man likes to exercise his preference in such a matter anyway and not be compelled to paper over a wall to hide defects in the lime finish of the plaster.

It therefore behooves the contractor to have a session with his plasterer and see that he makes a strong point of quality in this lime finish, not only to get a clean white lime that will have a good finish—in fact, that is really a secondary consideration, as the color is usually a matter that is altered by tinting, anyway—but what is wanted is a lime finish that will stay on and not be pitting or powdering off for months after the walls are finished. There may naturally be a little of lime dusting off for the first few days after the walls have hardened, but a properly handled lime finish should stick well enough to a plastered wall that it will not be pitting and powdering off for the next six months or more.

It seems to be a matter of letting the lime and water set longer in the mortar box to insure thorough hydration of every particle of lime. In some instances it may be a matter of getting a better lime, a lime more thoroughly burned or a lime from a different kind of stone, but what it looks like generally is just a matter of a little more time and pains to slaking in the mortar box. If this is the remedy it is up to the contractor to see that it is applied, for both his reputation and the welfare of the plastered wall in the future depend considerably on getting the highest degree of satisfaction in the work.—Building Age.

In devising new devices it is well to remember that perfection lies in the direction of simplicity.



Section and first floor plan of prize brick house.

Where and How to Build Closets and Cupboards in the House : :

When a builder is erecting a house he should never forget to make use of all available space for closets and cupboards. Especially is this true of houses built for sale. The following suggestions are from the Woman's Home Companion.

CLOSETS and cupboards are of two kinds: Either they are useful and convenient or of a charming design, or unexpected location that makes them so attractive that a housekeeper will gladly invent uses for them to justify their being. Modern closets belong as a rule in the former class. Ingenious and practical, it is easily recognized that some far-seeing woman aided architect or builder, perhaps at the cost of considerable insistence. The delightful cupboards, tantalizing with conjecture as to what they may contain, belong usually in old colonial houses. The cupboards, little and big, are attractive with paneling and with quaint knobs and hinges. Modern builders are beginning to imitate these old-time styles with good effect.

Charm and utility can be combined in closet or cupboard, but everyone knows how frequent is the kind that possesses neither of these qualities and is a hindrance rather than a help, the kitchen cupboard that forces the housekeeper to kneel in order to get at her kettles and pans, or to climb chairs or step-ladders to reach her dishes and the ugly, dark clothes-closets with inconveniently arranged hooks. The modern house that has undergone the searching scrutiny of a practical housekeeper who knows exactly what she wants is especially rich in second-floor closets. The sewing-room is probably filled at one end with built-in cupboards. The paneled doors open to show deep drawers and shelves for holding materials, with compartments for thread and needles. There is a place for the sewing-machine, always an eyesore and in the way when not in use. With this closet the room is never cluttered, and things for sewing can be put in readiness at a moment's notice.

Bedroom Closets Carefully Planned

Bedroom closets now-a-days are very carefully planned. Two good-sized clothes-closets are none too many for each sleeping-room. Rods with hangers strung on them are used instead of hooks, as garments can be arranged in this way with economy of space. Compartments for shoes and boots are another convenient feature. An electric light that turns on automatically when the door is opened is a convenience which is easily attained.

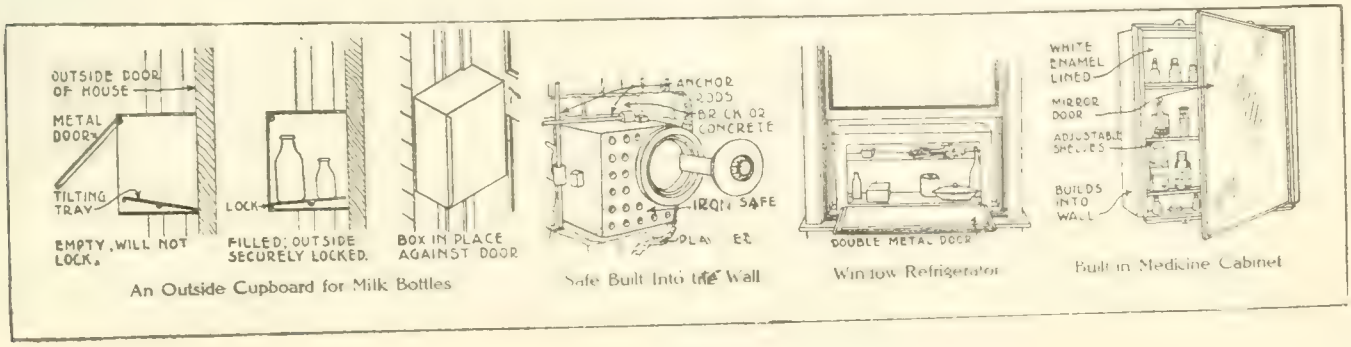
Linen-closets are usually placed in the second floor hall. An attractive one has several drawers flush with the wall and apparently built in its thickness. They are really let into a bedroom closet of good size, where the projection they make forms a stand for hat-boxes. Another hall closet with doors, has shelves for linen, with a compartment at one end for brooms and carpet-sweeper for second floor use.

Nursery closets of recent building contain, instead of hooks, a system of sliding trays placed one above the other on cleats. They are light, and an entire tray with its contents can readily be carried into the nursery when needed. The trays could easily be made by an amateur workman, using for them soft wood or a heavy paper board covered with muslin or cretonne to give a smooth surface.

Kitchen Closets of Special Interest

Kitchen cupboards are of special interest to those whose profession include sthe practice of cookery, and their arrangement is the subject for earnest thought on the part of every home-builder. As small kitchens are now preferred to large ones, a plan that puts cupboards and closets near the range, to save useless walking, is a favorite one . Sometimes kitchen cabinets are opposite the range with only a narrow aisle between, as in modern dining-car kitchens. A convenient cupboard, which is illustrated on this page, has shelves neither high nor low, but within easy reach. This cupboard is used for kitchen pottery and the materials and condiments used in cooking. Underneath it are two boards that slide into the wall, or are pulled out to form projecting ledges. They are useful to prepare food upon and are out of the way when not needed. Drawers beneath for holding dish towels are not too low for convenient use, and there is a small drawer with compartments for kitchen knives and forks. At one side a rack built around a corner has wooden pegs used as hooks for saucepans and skillets, with a place beneath for covers. This arrangement was put up by a carpenter. Gum was the wood used. This wood is usually attractive in grain and texture, and not much more expensive than Georgia pine. It is finished in the natural grayish-brown color, with a wax finish, and is kept clean by an occasional rubbing with paraffin oil. The cupboard doors are of very simple construction. Wide boards were used, fastened together on the back by cleats and on the front by long iron hinges. The space left vacant high on the wall might be used in the adjoining dining-room for a dust-proof cupboard, used for storing rarely used dishes.

A kettle cupboard for all the saucepans and kettles



An Outside Cupboard for Milk Bottles — Safe Built Into the Wall — Window Refrigerator — Built in Medicine Cabinet

needed in the household, with hooks inside the door to hold the kettle-covers, is a great convenience.

Chimney cupboards are not often seen in modern houses, but it is easy to arrange flues so that room is left for a good-sized cupboard in an end or in the front of the chimney above the mantelpiece. In a bedroom cupboards are useful as storing places for bed-linen and blankets; in a dining-room for china.

It is within the power of every woman who is helping to plan her own home to build attractive cupboards that are especially suited to her needs. To find room in the kitchen wall for a niche to hold ironing-board and flat-irons, to contrive a cupboard that incloses a hot-water tank or a linen-closet with a broom compartment are distinct achievements well worth your consideration.

Wardrobe cabinets are useful for men and women. They are handy, practical little space savers, and do not cost too much. In cabinets for men the garments are supported on hangers, and there are trays for shirts, and lockers for collars, cuffs and ties. Cabinets for women have trays for skirts to be laid out at full length without folding.

Small Safes and Cupboards

An excellent little fireproof wall safe with a combination lock may be built into the bedroom wall. This device is nothing but a cast metal box, about ten inches square on the inside. The polished steel door is round, with a combination lock like an ordinary safe. Conceal your wall safe behind a picture, or you may build it into a chimney.

A useful outside cupboard for milk bottles consists of a galvanized iron box, open on one side and closed by a cover on the other. This box is screwed to the door frame of the rear entrance door, with the open side tight against the door. When the milkman is making his rounds early in the morning he places the full bottles inside the box and slams the cover, which locks. To remove the bottles you must open the house door. This is a theftproof, weatherproof device of considerable usefulness. The box ought to be painted to match the door frame, to provide durability as well as good appearance, for galvanized iron will rust when unpainted.

Winter Window Refrigerator

For winter storage of food you will find a galvanized window refrigerator of great utility. This stands in the pantry window and is large enough to contain food for a family of [illegible]. The box, which has a double metal door, [illegible] to let cold air enter the refrigerator but [illegible] the pantry, have two boards made, one for each side, to fill up the space between the side of the window frame and the refrigerator. Thus, when the window is opened to cool the refrigerator, the side boards prevent cold air from entering the pantry.

A cupboard for [illegible] will prove a great convenience [illegible]. It is easily made by building the wall in which table leaves come into a wall, and hanging a door on the outside. There is almost no place in the house for table leaves except in the cellar, and the convenience of keeping them out of the way in the kitchen will be greatly appreciated by every housekeeper.

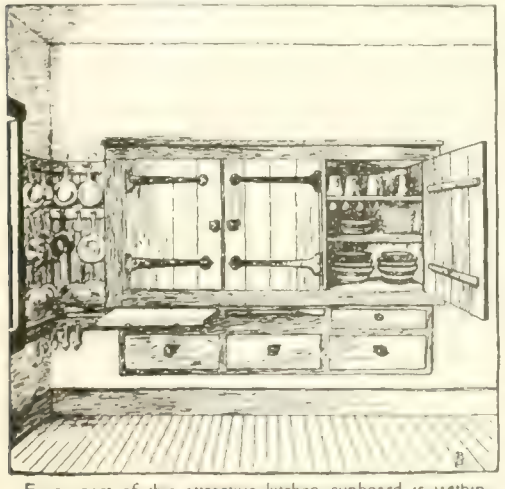
Medicine Cupboard a Necessity

A medicine cupboard in the bathroom is a practical necessity. It is used for soap, toothbrushes, bottles and towels. You may make a medicine cupboard out of an old shallow box, built into the bathroom wall, or you may buy one of the new enameled-metal cabinets. The shelves should be adjustable, and a toilet mirror may well be applied to the door. In this case place the cabinet over the washbowl.

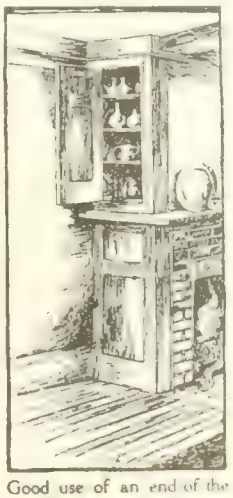
The ideal linen closet will have no drawers to bind or rattle. Drawers are inconvenient for storing linen, as the depth necessary to hold linen satisfactorily makes them very heavy. In addition is the annoyance of pulling a drawer forward and taking out all the linen on top to get at that below.

Use open shelves in your linen closet and hang double doors, like a wardrobe closet. Have the shelves adjustable, so you may lift them up or down at will. On shelves the linen lies right before you, where you can reach each piece without disturbing any other. For a house on a dusty street have outer and inner doors [illegible] linen closet.

A good storeroom for linen usually has an aisle in the middle, with cupboards on both sides; and no drawers, always shelves. Of course the extent of such a storeroom is a matter which would need to be determined by each housekeeper, for the requirements very naturally vary in each individual household. For instance, if a large family of girls is to be provided for it is a frequent custom to provide space in the storeroom for some of their clothes which are not in constant use, by installing one or more separate compartments in which gowns may be hung. Other families

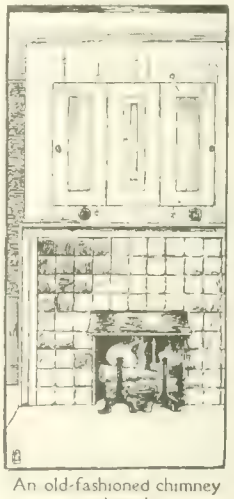


Every part of this attractive kitchen cupboard is within easy reach of the housewife



Good use of an end of the dining-room fireplace

For holding kettles and saucepans and their lids



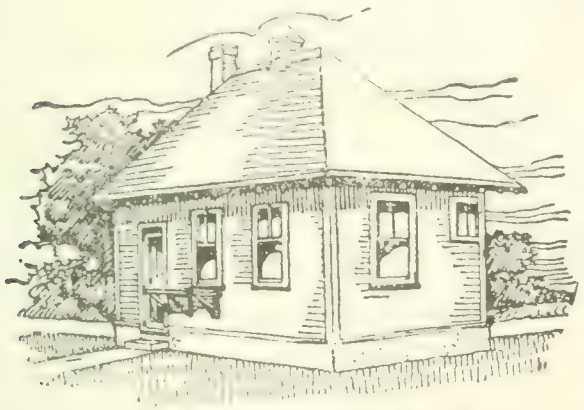
An old-fashioned chimney cupboard

require more than the usual amount of bed and table linen, and for such the storeroom must be larger than for small families, where often no storeroom would be required, the linen being kept in an ordinary linen closet.

It has been found a good plan in many houses to combine the storeroom with a sewing-room by making it a little more spacious than is ordinarily the case, with cupboards for linen on both sides and space for sewing in the centre.

Dairy House for Market Milk

The accompanying drawings show the inside arrangement and the outside appearance of an excellent dairy building for a market milk dairy. The size can be varied according to the requirements, but the arrangement is especially good. The building should be connected with the dairy barn by a covered vestibule.

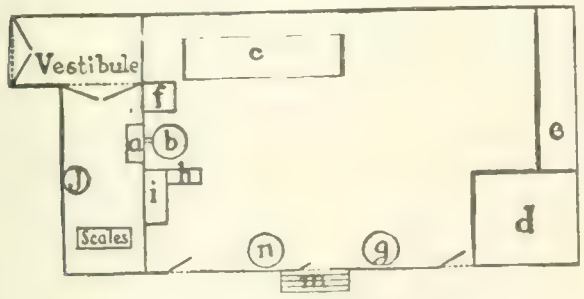


An excellent dairy building.

This vestibule should have double doors to prevent the passing of dust from the cows into the milk room.

The milkers bring the milk into the weighing room, where it is weighed and emptied into a receiver, (a). From this it passes into a mixer, (b). This insures the mixing of the milk from all of the cows of the herd, which is quite a necessary thing in supplying milk to the city trade.

The milk is bottled on the table, (c). A separator, (n), is for separating any surplus. At (d) is the refrigerator and at (e) a cooling tank. If there is ice on the farm, it may be used in the refrigerator, but if there



Inside arrangement of milk house.

is none, a pipe running from a good well into the tank, (e), will be sufficient for cooling the milk. The hot water and steam are furnished by a boiler, (j). (i) is a tank for washing bottles and utensils and (h) is a bottle washer; (f) is a sterilizer for sterilizing the milk utensils and (g) is a babcock tester, (m) is a rack on the outside of the buildings for sunning pails and cans.

Trucks Saved Montreal Contractor 55 Cents a Ton

A Montreal, P.Q., contracting firm recently undertook to test the practical possibilities of trucks with trailers in work in that city, using one and two trailers, these being animal wagons that had been adapted for the service and which were constructed to be discharged quickly. The trains are made up with two trailers, carrying nine tons, 2.5 tons on the truck and 3.25 tons on each wogan, and it was found that the truck could haul the trailers over comparatively rough ground and in soft roads at a satisfactory speed—at least, fast enough to be very economical. The cost of moving excavated material was with the loads described reduced from $1.50 to 95 cents, the comparison, of course, being made with horse haulage. So satisfactory was the trial that the company bought seven four and five-ton trucks and will use them with trailers in excavation work whenever possible, and in other haulage wherever practical.

Concrete Refrigerators

One of the newest forms in which cement has appeared within the home is that of the refrigerator. Such a refrigerator has a steel frame covered with mesh wire and incased with a layer of concrete which is coated with waterproofing and two coats of cement enamel. There is an air space between the inner and outer walls, which is filled with cork or left vacant, providing a dead air space which prevents the melting of ice within. Supports for the interior shelves are inserted in the concrete walls or fastened to the steel skeleton. A coating of waterproofing enamel gives the refrigerator all the advantages of tile, with the added feature of its being practically monolithic—no joints or cracks.

The doors are flush with the outside, and when closed are forced by the lever handle against a rubber cushion, thus forming an air tight contact.

A Wet Weather Test for Varnish

One of the larger railway systems wanted to test a waterproof varnish to use on their locomotives so they decided to test the various varnishes in actual service. The undercoats of the locomotive tanks were all the same. Then the entire surface was divided off into the number of samples and each space covered with two coats of a sample. When the tank came out it was a brilliant black. It only took a month of hot weather to get a half dozen different shades of black. The cold water in the tank caused it to sweat continuously.

TO BE HONEST, to be kind—to earn a little and to spend a little less, to make upon the whole a family happier for his presence; to renounce when that shall be necessary and not to be embittered; to keep a few friends, but these without capitulation above all, on the same grim conditions, to keep friends with himself—here is a task for all a man has of fortitude and delicacy.

Robert Louis Stevenson.

News of Builders' Exchanges

Builders' Exchange at Brandon, Man.

A Builders' Exchange has recently been formed at Brandon, Manitoba, with 70 charter members, and the number is rapidly growing. The following officers have been chosen:

President, T. M. Harrington; Vice-President, J. D. Kennedy; Treasurer, A. R. McDonald; Secretary, E. P. Fuller. The outlook is regarded as very promising, and the members are correspondingly enthusiastic.

Toronto Exchange Holds Bowling Tournament

On Tuesday, August 19, about 40 members of the Toronto Builders' Exchange spent an enjoyable afternoon at lawn bowling on the greens of the New Beach Bowling Club, Lee Ave. It was intended to take a motor trip to Burlington, Ont., but, owing to the sudden death of Mr. Burgess, a member of the Exchange and a prominent contractor of Toronto, this trip was called off.

Annual Outing of Montreal Builders' Exchange

The annual outing of the Montreal Builders' Exchange was a big success. This year, the members and their friends went to New London, a resort not far from New York City. Owing to the fact that this outing came at the time when builders are busiest and also that it occupied three or four days, not many members took the trip, but those who did had a "whale of a time." The following composed the party: Joseph Prince and wife, J. O. Martineau and wife, J. A. Gordon and wife; A. E. Wand and wife; Ernest Richardson and wife; W. H. Edwards and wife; A. N. Tessier and wife; Edward Cavanagh and wife; Walter Livermore and wife; Miss E. McCulloch, and Mr. T. Charpentier, W. E. Potter, R. L. Werry, A. J. Hoolahan, A. Krause, Mr. Baxter and wife.

The routine of the outing was:

Saturday, Aug. 16

11 a.m. Leave hotels by trolley for Ocean Beach, where shore dinner will be served at 12.30.

4.20 p.m. Boat trip to Norwich. Those taking this ride will leave the beach at 3.30 p.m. for the city. Evening meal at Norwich and return by trolley. Evening entertainment on the beach or otherwise at option of each individual.

Sunday

Morning. "Nothing doing."

2.00 p.m.—Take ferry for Groton.

2.30 p.m. Leave Groton by trolley for Westerly, Watch Hill and Stonington. Return for supper.

Monday

10.40 a.m. Boat trip to Block Island, lunch on board: due back in New London, at 5.30 p.m.

All the party did not stick to this, however, and some went to New York and other nearby cities for Saturday night and Sunday. Those who stayed at the beach were treated to swimming and boat races and to aeronautic exhibitions.

The shore dinner certainly savored of the sea. They say that fish makes brains, and if all the party went through the menu, the Montreal crowd must certainly [illegible] matter. Here is the bill of fare:

THIS SHORE DINNER: $1.00.

Clam Chowder

Steamed Clams Baked Sea Trout Tomato Sauce

Clam Fritters Potato Salad

Sliced Cucumbers Sliced Tomatoes Sliced Onions

Radishes Sweet Potatoes Sweet Corn

Cold Boiled Lobster

White Bread Brown Bread Hard Tack

Watermelon

With Soft Shell Crabs, $1.25

With Live Broiled Lobster, 1.50

The boat rides were much enjoyed. Competent guides accompanied the party, and every point of interest along the way was pointed out. During this trip, each person was presented with a souvenir medal by John Humphrey, secretary of the New London Boost Club.

A feature of the outing was the Excursion Song Competition. The judges, two New London newspaper editors and the travelling passenger agent of the Central Vermont Railway, awarded the prize to John Haslam, who wrote a pathetic little ballad entitled "Woe Song of the Swordfishers." The prize was one of the souvenir medals.

There was not a single hitch in the arrangements, not an accident and no sickness, barring a little seasickness on the boat trips. Everyone had a good time.

Cupboard in $4,000 Brick House

Fig. 1.—Cupboard in kitchen. It is fully described on page 25.

Waterproofing of Concrete—Permeability of Concrete—Effect of Foreign Substances, etc.

A report of a committee before the American Society for Testing Materials.

THE committee reports that while it has not been able to arrive at sufficiently definite conclusions to enable it to formulate specifications for the making of concrete structures waterproof or for materials to be used in such work, it has reached certain conclusions which may be of assistance to the contractor in securing the desired result of impermeable concrete. Early in the investigation, the work was found to sub-divide naturally into three branches, and the conclusions reached will be grouped in order under these sub-divisions, which are:

1—The determination of causes of the permeability of concrete as usually made from mixtures of Portland cement, sand and stone, or other coarse aggregate, in proportions of from 1 cement, 2 sand and 4 stone, to 1 cement, 3 sand and 6 stone, and the best methods of avoiding these causes.

2—The rendering of concrete more waterproof by adding to ordinary mixtures of cement, sand and stone, other substances which, either by their void-filling or repellent action, would tend to make the concrete less permeable.

3—The treatment of exposed surfaces after the concrete or mortar has been put in place and hardened more or less, either by penetrative, void-filling or repellent liquids, making the concrete itself less permeable or by extraneous protective coatings, preventing water having access to the concrete.

Considering these several sub-divisions separately and in the order named, the committee finds:

Causes of Permeability of Concrete.

That in the laboratory under test conditions using properly graded and sized coarse and fine aggregates, in mixtures ranging from 1 cement, 2 sand and 4 stone, to 1 cement, 3 sand and 6 stone, impermeable concrete can invariably be produced. That even with sand of poor granulometric composition, with mixtures as rich as 1 cement, 2 sand and 4 stone, permeable concrete is seldom, if ever, found, and is a rare occurrence with mixtures of 1 cement, 3 sand and 6 stone. But the fact remains, nevertheless, that the reverse obtains in actual construction, permeable concretes being encountered even with 1 cement, 2 sand and 4 stone mixtures and are of frequent occurrence where the quantity of the aggregate is increased. This the committee attribute to:

(a) Defective workmanship, resulting from improper proportioning, lack of thorough mixing, separation of the coarse aggregate from the fine aggregate and cement in transporting and placing the mixed concrete, lack of density through insufficient tamping or spading, and improper bonding of work joints, etc.

(b) The use of imperfectly sized and graded aggregates;

(c) The use of excessive water, causing shrinkage cracks and formation of laitance seams;

(d) The lack of proper provision to take care of expansion and contraction, causing subsequent cracking.

Theoretically, none of these conditions should prevail on properly designed and supervised work, and are avoided in the laboratory and in the field, under test conditions, where speed of construction and cost are negligible items, instead of being governing features as they must be in actual construction. Properly graded sands and coarse aggregates are rarely, if ever, found in nature in sufficient quantities to be available for large construction, and the effect of poorly graded aggregates in producing permeable concrete is aggravated by poor and inefficient field work. Even if we could afford the added expense of screening and remixing the aggregates so as to secure proper granulometric composition to give the density required to make untreated concretes impermeable, it is seemingly a commercial impossibility on large construction to obtain workmanship even approximating that found in laboratory work. It therefore seems that we can secure impermeable concrete most economically by adopting some special waterproofing treatment.

Addition of Foreign Substances to Cement or During Mixture.

The committee finds that in consequence of the conditions outlined above, the use of substances calculated to make the concrete more impermeable—either incorporated in the cement or added to the concrete during mixing—has become general. This has resulted in the development and placing on the market of numerous patented or proprietary waterproofing compounds, the composition of which is more or less of a trade secret.

While it has been impossible for the committee to test all of the special waterproofing compounds being placed on the market, it has investigated a sufficient number of these, as well as the use of certain very finely-divided, naturally-occurring or readily-obtainable commercial mineral products, such as finely-ground sand, colloidal clays, hydrated lime, etc., to form a general idea of the value of the different types. The committee finds:

(a) That the majority of patented and proprietary integral compounds tested have little or no permanent effect on the permeability of concrete and that some of these even have an injurious effect on the strength of mortar and concrete in which they are incorporated:

(b) That the permanent effect of such integral waterproofing additions, if dependent on the action of organic compounds, is very doubtful:

(c) That in view of their possible effect, not only upon the early strength, but also upon the durability of concrete after considerable periods, no integral waterproofing material should be used unless it has been subjected to long-time practical tests under proper observation to demonstrate its value, and unless its ingredients and the proportion in which they are present are known;

(d) That in general, more desirable results are obtainable from inert compounds acting mechanically, than from active chemical compounds whose efficiency depends on change of form through chemical action after addition to the concrete;

(e) That void-filling substances are more to be relied upon than those whose value depends on repellent action;

(a) That assuring average quality in sizing of the aggregates and reasonably good workmanship in the mixing and placing of the concretes, the addition of from 10 to 20 per cent. of very finely divided void-filling mineral substances may be expected to result in the production of concrete which under ordinary conditions of exposure will be found impermeable, provided the work joints are properly bonded, and cracks do not develop on drying or thorough cutting change in volume due to atmospheric changes, or by settlement.

External Treatments.

While external treatment of concrete would not be necessary if the concrete itself, either naturally or by the addition of waterproofing material, was impermeable to water, it has been found in practice that in large construction, no matter how carefully the concrete itself has been made, cracks are apt to develop, due to shrinkage in drying out, expansion and contraction under change of temperature, and moisture content and through settlement.

It is, therefore, often advisable on important construction to anticipate and provide for the possible occurrence of such cracks by external treatment with protective coatings. Such coating must be sufficiently elastic and cohesive to prevent the cracks extending through the coating itself. The application of merely penetrative void-filling liquid washes will not prevent the passage of water due to cracking of the concrete. The committee has, therefore, divided surface treatments into two heads:

(a) Penetrative void-filling liquid washes;

(b) Protective coatings, including all surface applications intended to prevent water coming in contact with the concrete.

While many penetrative washes are efficient in rendering concrete waterproof for limited periods, their efficiency is apt to decrease with time, and it may be necessary to repeat such treatment. Some of these washes may be objectionable, due to discoloring the surface to which they are applied. The committee, therefore, believes that the first effort should be made to secure a concrete that is impermeable in itself and that penetrative void-filling washes should only be resorted to as a corrective measure.

Asphaltic Coatings.

While protective extraneous bituminous or asphaltic coatings are unnecessary, so far as the major portion of the concrete surface is concerned, provided the concrete—either in itself or through the addition of integral compounds—is made impermeable, they are valuable as a protection where cracks develop in a structure. It is therefore recommended that combination of the two methods—integral and extraneous waterproofing—be adopted in especially difficult or important work.

Considering the use of bituminous or asphaltic coatings, the committee finds:

(a) That such protective coatings are often subject to more or less deterioration with time, and may be attacked by injurious vapors or deleterious substances in solution in the water coming in contact with them;

(b) That the most effective method for applying such protection is either the setting of a course of impervious brick dipped in bituminous material into a solid bed of bituminous material, or the application of a sufficient number of layers of satisfactory membranous material cemented together with hot bitumen;

(c) That their durability and efficiency are very largely dependent on the care with which they are applied.

Such care refers particularly to proper cleaning and preparation of the concrete to insure as dry a surface as possible before application of the protective covering, the lapping of all joints of the membranous layers, and their thorough coating with the protective material. The use of this method of protection is further desirable because proper bituminous coverings offer resistance to stray electrical currents, the possible attack from which is referred to later:

So far, the committee has considered only concretes of the usual proportions, namely, those ranging from 1 cement, 2 sand and 4 stone, to 1 cement, 3 sand and 6 stone. It has been suggested that impermeable concretes could be assured by using mixtures considerbaly richer in cement. While such practice would probably result in an immediate impermeable concrete, it is believed by many that the advantage is only temporary, as richer concretes are more subject to check cracking and are less constant in volume under changes of conditions of temperature, moisture, etc. Therefore, the use of more cement in mass concrete would cause increased cracking, unless some means of controlling the expansion and contraction be discovered. With reinforced concretes the objection is not so great, as the tendency to cracking is more or less counteracted by the reinforcement.

It has also been suggested that the presence in the cement of a larger percentage of very fine flour might result in the production of a denser and more impermeable concrete, through the formation of a larger amount of colloidal gels.

Neither of these suggestions have been especially investigated by the committee. Both appeal to the committee, however, for the reason that they substitute active cementitious substances for the largely inactive void-filling materials previously recommended, thus increasing the strength of the concrete.

Conclusion.

In conclusion, the committee would point out that no addition of waterproofing compounds or substances can be relied upon to completely counteract the effect of bad workmanship, and that the production of impermeable concrete can only be hoped for where there is determined insistance on good workmanship.

The production of impermeable concrete has assumed greater importance since the appointment of this committee, owing to the well-known injurious action of saline or alkaline waters and to the suggested possible effect of the moisture in concrete occasioning or aggravating electrical action from stray currents.

Originally, the question of waterproofing involved mainly the physical troubles resulting from water passing through concrete without any special consideration of its effect on its durability, or other than a gradual leaching out of the cement. Recent developments suggest the possibility that owing to the increased conductivity of damp concrete to electrical currents, such currents, if present, may so affect damp concrete as to seriously lessen its integrity, and this possibility further emphasizes the importance of the recommendation that no waterproofing compound of unknown chemical composition be added to concrete, as recent tests seem to show that the action of electrical currents is aggravated by the presence of certain solutions.

Make it your business to know what is the best thing in your line, and then work in that direction.

Making Buildings Rat Proof

By Friench Simpson

Abstract from a bulletin issued by the United States Public Health Service.

In a bulletin on how to make buildings ratproof, issued by the United States Public Health Service, Friench Simpson says that those contemplating the erection of a new or the repair of an old building, whether of frame, brick, rock, concrete, or other construction, should be informed as to the sanitary and economic benefits to be derived from ratproofing measures of a permanent character, and should require the scrupulous application of such measures as a part of the builder's contract. The expense to be incurred is slight when compared with the cost of the building, and the measures applied will insure not only practical freedom from rats but in most cases freedom from various insects as well.

It is a popular fallacy that rats may be eliminated by poison and traps, whereas such measures used alone serve only to reduce their numbers, provide a greater abundance of food for survivors, and possibly stimulate multiplication. Neither trapping nor poisoning nor the combination of the two will alone rid premises of rats, for they breed four or five times a year, and although trapped or poisoned, the birth rate keeps pace with the death rate.

For the successful elimination of the rat a third measure is absolutely essential, viz., the separation of the rat from his food supply. This will require in every instance certain structural alterations in buildings harboring them. After such changes have been effected, poison and traps become important adjuncts.

For practical purposes, a ratproof building may be defined as follows: A building constructed of material impervious to rats, in which all unnecessary or accidental openings have been permanently closed, and all natural openings provided with doors, windows, gratings or screens closely approximating such openings, and securely closed when the building is not in use.

The rat can be built out and destroyed by the application of the following measures:

The erection of ratproof buildings only.

The closure of all natural or accidental openings in existing buildings of ratproof construction.

The remodeling of all non-ratproof buildings, using materials impervious to rats.

The removal of material covering yards, sidewalks, and passageways which will permit rat refuge.

The protection or removal of rat food.

The destruction of rats by poison and traps.

The Ratproofing of the New Building.

The new building, if of frame construction, should be placed upon a foundation wall of material impervious to rats, such as brick or concrete. This wall should be not less than six inches in thickness; should be laid without break around the entire building; should extend not less than eighteen inches beneath the surface of the surrounding soil and upward flush with the under surface of the floor above. Floor joists should be embedded in this wall, or the spaces between the joists filled in and perfectly closed, up to the floor level.

Ground Areas.

The ground area enclosed by foundation walls requires especial attention. If no food products are to be stored, prepared, or sold on the premises, the ground area should be covered with a layer of concrete not less than three inches in thickness, above which a floor of tongue-and-groove lumber should be placed, disregarding the dead space remaining between.

If the building is to be used as a fish market, bakery shop, sausage factory, candy factory, restaurant kitchen or for the preparation of other foodstuffs, the ground area should be filled in with clean earth or sand to within three inches of the top of the foundation wall, over which should then be placed a layer of concrete not less than three inches in thickness, finished with a layer of cement not less than one-half inch in thickness. This surface, representing the floor of the building, should, for sanitary reasons, remain uncovered.

If the building is to be used as a bakery shop, meat market, butter shop, restaurant, delicatessen shop, or other place where foodstuffs are stored or kept for sale, the ground area preferably should be treated in a manner similar to that required where foodstuffs are prepared, a wooden floor, if desired, being closely laid over the concrete surface, care being used to see that no dead space sufficient to admit rats remains between the two. In lieu of this, the ground area should be covered with a layer of concrete not less than three inches in thickness, and the floor above constructed of two layers of one-inch tongue-and-groove lumber, driven tight, between which should be placed a layer of wire cloth not less than 20 gauge nor greater than one-half inch mesh. This wire cloth should extend upward eight inches on the side walls, and be covered with the baseboard.

Basement Ceilings.

Wherever practicable and not prohibited by fire ordinance, basement ceilings should remain open and unsealed, in order that rat refuge may be prevented between the basement ceiling ceiling and the floor above. If a finished ceiling is required, such ceilings should be made and kept rat-tight. Should the premises above such sealed basements be used for the storage, preparation or sale of foodstuffs, the floor above the basement ceiling should be constructed of two layers of one-inch tongue-and-groove lumber driven tight, between which should be placed a layer of galvanized iron wire cloth not less than 20 gauge nor greater than one-half-inch mesh. This wire cloth should extend upward on the side walls not less than eight inches, and be covered with the baseboard.

Where the expense will not permit the installation of ratproof foundation walls as described, ratproofing of frame structures (if not contrary to building laws) may be accomplished in a less satisfactory and less permanent way by elevation. In this case the building must be elevated on free underpinning, not less than eighteen inches above the surface of the surrounding soil. It is important that the ground area beneath the elevated structure remain clean at all times, and clear of lumber, boxes and debris; otherwise a convenient and perfect harboring place for rats will be provided.

If the building is to be constructed of brick, stone or

concrete foundation wall as outlined will of necessity be required to support the building. The same careful attention must be given to natural or unnecessary openings which may be made in the wall. Should chimney flues be carried by the wall from the basement to the roof and remain unused the openings should be closed with wire mesh or stopped with a close-fitting cover.

Side walls above the basement containing openings require little attention unless the building is in close proximity to adjacent structures or such openings convey electric or other wires, in which event the openings should be screened or kept closed.

The bulletin brings out the importance of having all windows, skylights, doors, etc., kept tightly shut, and covered with close mesh wire. Basement windows in particular, should be given attention. Plumbers, electricians and others often neglect to properly close openings made for wires and pipes, and these afford excellent chance for rats to enter. To do this requires a very careful inspection, but if the building is to be ratproof, it is absolutely necessary. Old broken, and abandoned pipes previously used for water or sewage occasionally are found entering basement walls. They offer a convenient highway for rats between the basement and the street or sewer, and should be permanently stopped with cement.

Open conduits for the conveyance of electric cables may be frequently noted entering basement walls. Openings around and within such conduits should be closed with fine cement.

The lower ends of chimney flues entering the basement, if unused, should be screened. They frequently convey electric wires from the roof to the basement. Black and roof rats easily climb up and down these wires, and in this way reach the roof or basement.

The Remodeling of Non-ratproof Buildings.

This classification includes all frame structures, with or without basements, and generally without foundation walls and and floors impervious to rats. The majority of all buildings fall within this class, and since they permit the easy access of rats, supply food and afford refuge, they represent the principal obstacle to be overcome in the ratproofing of cities or towns.

All such buildings should be remodeled and constructed with brick or concrete area walls, but since the area wall to be provided in such cases is for ratproofiing purposes alone, the foundation wall of the structure need not be disturbed, the area wall being erected just within or without and against the old foundation. Preferably, this wall should be erected just withtin the old foundation. It should be constructed of brick, stone or concrete, not less than six inches in thickness, should extend not less than eighteen inches beneath the surface of the surrounding soil and upward, until flush with the under side of the floor above. Should the building rest upon a brick or concrete foundation, an additional wall will not be required, but care should be used to see that the foundation wall extends entirely around the building. Wherever lacking in this respect, or otherwise defective, it should be repaired. If floor joists rest upon the top of this wall, the wall should be continued upward between such joists until flush with the under surface of the floor above. All openings around pipes or wires should be sealed with cement.

The ground areas or basement floors of such structures and upper floors and roofs should be treated in the manner outlined for new buildings, particular care being used to see that the additional ratproofing requirements are employed when such buildings contain foodstuffs.

In ratproofing dwellings it should be known that the greatest number of rats can usually be caught under the front steps. This should be remembered when remodeling measures are applied.

Cost of Excavating for a Building Foundation Using a Steam Shovel

In excavating for the foundations of a reinforced concrete building in Boston, the Aberthaw Construction Co., of Boston, reports cost figures which are low for a city job where the hauls to dumps averaged over a mile. The site was excavated to 10 ft. deep; the digging was good; there were no rocks, the material being mostly cinders. A 2-3 cubic yard Thew steam shovel was used and the carting was done by 2-horse end dumping wagons each of a capacity of 2 cu. yds.; in other words, each wagon had a capacity of three shovelsful. The total cost of the 6,976 cu. yds. excavated, including excavating, labor, teaming and dumping, lumber for runs, and all fuel and other expense in connection with the shovel, was 66 5-6 cts. per cubic yard. The itemized figures are presented below:

EXCAVATING

Shovel, 25 days	$ 300.00
1 Engineer, 25 days at $37.00 per week 1 Fireman, 25 days at $18.00 per week	229.00
1 Foreman, 25 days 6 hours at $5.00	83.00
2 Laborers trimming around shovel at $2.00	100.00
Preparatory to shovel and other labor, during shoveling, 411 men at $2.00, estimated 10 per cent. at dump	740.00
Miscellaneous laborers	37.00
	$1,489.00

Excavating 6,976 yards 21 1-3 cts. per cubic yard; dose not include runway.

TEAMING AND DUMPING

481 teams at $6	$2,886.00
Foreman, 32 days at 10 hrs. at $5	176.00
Laborers	82.00
Lumber for runs	31.00
	$3,175.00

Teaming and dumping 6,976 yards cost 45½ cts. per cubic yard.

Total cost per yard of excavating, teaming and dumping 21 1-3 + 45½ = 66 5-6 cts.

Edmonton Builder Goes to China

The appointment of Wm. C. Leonard, of Edmonton, Alberta, as a missionary builder by the Sub-Committee of the Methodist Missionary Society of Toronto marks practically the beginning of a building staff of experienced contractors to supervise the necessary building in China. The appointment is unique inasmuch as he is only the second experienced builder that has been sent to China by the Methodist Church for missionary purposes. The other builder left some four years ago together with one of Toronto's architects, Mr. F. E. L Abrey. Since their arrival in China modern buildings, including houses, churches, schools and dispensaries, have been erected.

Until recent years the various missionaries were compelled to do all their own building in spite of their lack of experience.

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Editorial Comment

Inconsistencies of Toronto's Building Permit Department.

The inconsistencies of officials in connection with the issuing of building permits is quite apparent in the city of Toronto. Some time ago a bank was refused a permit for the erection of a bank at the corner of Spadina Road and Bloor street, so the bank bought a house on an opposite corner and turned it into a money exchange. Now on the first corner there is a drug store combined with other stores, an apartment house, etc.

A widow wished to invest her savings in a building in Toronto, to do her share towards housing the thousands of people looking for homes annually in Toronto, and took out a permit to erect an apartment house on Harbord, corner of Palmerston. The building was erected as far as putting on the roof, when orders were given to have it "raised." The building faces on Harbord street, and is above the ordinary class of building on that street.

A couple of blocks away, however, the officials have allowed to be built on Harbord, corner of Clinton, a building that would hardly be allowed to be erected in the Ward, and which for size or appearance is not up to the standard of the other buildings on Harbord street, most certainly not in the same class with the one ordered to be "raised."

It looks as though the officials should be a trifle more consistent in the issuing of building permits in Toronto.

* * * *

Thirty-fifth Annual Canadian National Exhibition.

To the Builder or Carpenter who visited the National Exhibition, Toronto, this year, the show was a revelation. Never, perhaps, has there been gathered together, certainly not in Canada, such a collection of supplies and equipment of such interest to him. New house building methods in concrete, new lath laying methods, economical woodworking methods, metal goods, artificial stone, use of gas and electricity in the modern house, and all manner of builders' equipment were to be seen and investigated. The Exhibition offered an opporutnity of investigating all these things at very low cost. In fact, to attempt to see them in any other way would practically be prohibitory.

For the benefit of those who were unable to attend and to again bring the exhibits to the mind of those who saw them, we give in this issue an index of the various displays and the companies who were responsible for them. Should more information be desired about any of them a postal addressed to the exhibitor, will, we are sure, bring full particulars.

* * * *

Our Catalogue Number of "The Canadian Builder."

The November issue of The Canadian Builder will be the annual Catalogue Number. What is this catalogue number? Simply this:—A number gotten up for the convenience of our readers, to be used by them as a catalogue of plans of houses and other buildings; as a catalogue of building methods and as a catalogue of building equipment and supplies.

We wish each reader to take a personal interest in this number of The Canadian Builder, and this is how he can do it. You probably use equipment advertised in The Canadian Builder. Write us a letter telling us what results you have accomplished with this equipment. It may be a woodworker, a floor scraper, a concrete mixer, saw, hoist, brackets, etc.; or it may be that you have adopted a new material advertised by which you have secured an economy. We will pay the sum of one dollar for each letter containing a useful idea, on publication. Write to-day.

* * * *

A Personal Talk With Our Readers.

The editors would like to have a personal talk with each reader of The Canadian Builder and Carpenter. Many of you have ideas on the editorial matter we should publish. Many of you have excellent ideas which should be published. If all the readers were in one city and we could call on you at the rate of ten per day, it would take two years to go round. That would be a very slow process, so what we want our readers to do is this:—

Write us a letter telling us what you would like to see in the paper. We have letters from a number of readers telling us that certain articles were "just the thing I wanted." Are the articles we are publishing the thing you want?

Then, second, give us your ideas of how certain work should be done. We are publishing ideas and plans of buildings each month. Can you improve on them?

Writing out these methods will help you because it will crystalize it in your mind. It will help others because it will be new to them, and probably be a better method than they use. It will help us because it will show us that you are interested in the paper and are making it your paper. We will pay for all acceptable articles. May we not hear from you?

* * * *

The Classified Directory.

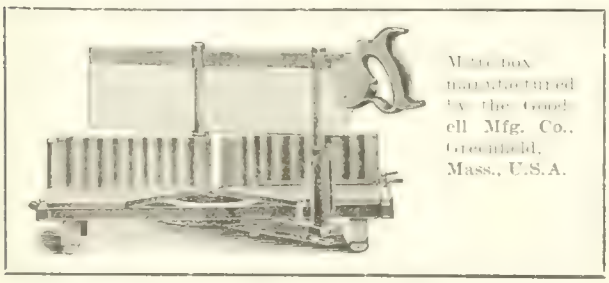
The Classified Directory should be one of the most useful reference directories used by a builder and carpenter. We take this opportunity of drawing to your attention the completeness of the one published in The Canadian Builder. Should you desire the name of any dealer in or manufacturer of builders' materials and equipment, and cannot locate it in the Classified Directory of The Canadian Builder, drop us a card and we will endeavor to obtain the information for you.

Our advertisers are requested to assist us in making this Directory complete and of greatest use to our readers.

New Equipment

The Goodell Steel Mitre Box

In placing on the market a steel mitre box, the Goodell Mfg. Co. had in mind the hard usage which such a tool meets in the shop, on the job and on its numerous trips from place to place. They believed that cast iron, from its brittle nature and its great liability to breaking, was entirely unsuited for the



Mitre box manufactured by the Goodell Mfg. Co., Greenfield, Mass., U.S.A.

purpose, although the wearing quality might be the same. Wood, which had lightness in its favor, would not stand the weather and dampness which frequently penetrated even the carpenter's tool chest.

The favorable comments which have been made on this mitre box indicate that the material was well chosen and the design of the box was well calculated to meet the carpenter's needs. The liability of breakage is entirely done away with, and the company does not even have to have a repair list. It is designed to be used at any regular or special angle, and the graduations being such that when two opposite cuts are wanted, the box is readily adjusted to cut them. Automatic stops hold the saw up, allowing the operator to use both hands in placing the work in position.

The complete circular of the Goodell Steel Mitre Box shows in detail the construction and advantages of the styles and sizes in which it is made. This circular will be sent upon request to the Goodell Mfg. Co., Greenfield, Mass., U.S.A.

Bow-Latt Lath Holder

The Bow-Latt lath holder is illustrated in the accompanying illustration. It is for use where expert lathers cannot be had, and may be used by a carpenter or an inexperienced handyman. With it 400 to 600 yards can be put on in a day. All breaks are uniform so there is no necessity of going over a room putting in "Dutchmen," which means in itself a big saving in time.

The operation of this lath holder is very simple, and is as follows:—The holder is placed on a bench, the lath are assempled (a full break at a time) in their respective openings, and butted against a straight edge. Grippers are held by separate springs to allow for variation in width of lath. A lever is now thrown which automatically spaces and locks all the lath. The holder is then hung on the studding on the bottom lath of the break above (or attached to the joists for ceiling work). It is now ready for the nails, the operator having nothing to do but drive nails. In the meantime a helper (who may be a boy or an inexperienced man) is loading another holder, and has it ready in position on the wall before the operator has finished nailing the first holder. The holders are patented in Canada and the United States by the Bow-Latt Lath Holder Co., Grand Haven, Mich. It should prove of great value to the builder in small towns, for, with the use of these holders, he can rush his job, putting on his entire lot of men, one man filling for three of four carpenters.

"Good Cheer" Warm Air Furnaces

The James Stewart Mfg. Co., Woodstock, Ont., and Winnipeg, Man., have issued a catalogue dealing with their "Good Cheer" warm air furnace which, as they state, is the only heater made with the circle waterpan. The catalogue gives a lot of good general information on heating which should be of interest to builders generally. A feature is the article on "Things that Shorten Life," by Harrison L. Beach. The catalogue should be read by Canadian builders.

The proper marketing of an article is just as important a function as the proper manufacture. Keep this fact in mind, make due allowance for it in cost figuring, then spend that allowance in proper selling effort, and you will help make business hum.

The Bow-Latt lath holder

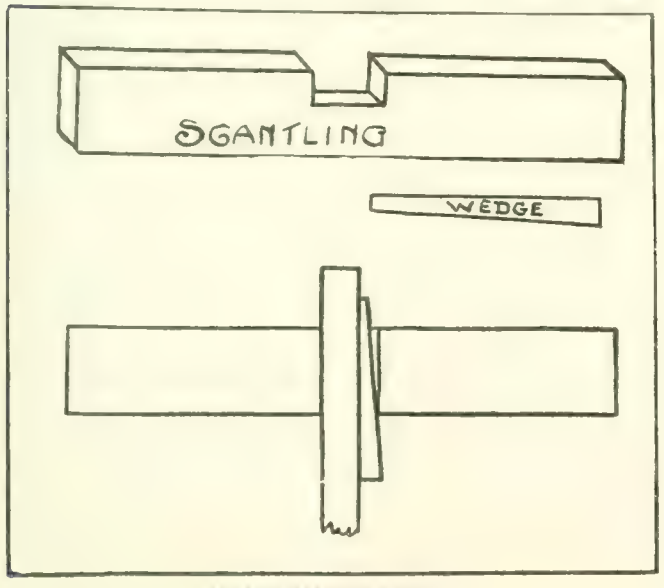
Carpentry and Woodworking

To Plane Edges of Door

By G. Curry

While looking over the Canadian Builder I noticed a method for holding a door while planing the edges. Here is a simpler plan: Take a scantling 3 ft. or longer and cut a notch in the center 1¼ in. wider than the door and 3 in. down, and take the piece out, then make a wedge out of 1 in. dressed board and put the door in the notch of the scantling and then drive wedge along side of door.

With this method you can move the door to the centre of the room away from the opening so other



Method of planing a door

workingmen can get in and out. It also holds the door plumb; the bottom will not move. With the other way with a board in the jam, the bottom of door will shift and likely you will make a bad job of the door. Besides, this plan holds the door off the floor out of sand or mortar that the carpenters have to put up with after the plasterers are through with their work.

Handrailing on the Block System*

By John MacLachlan

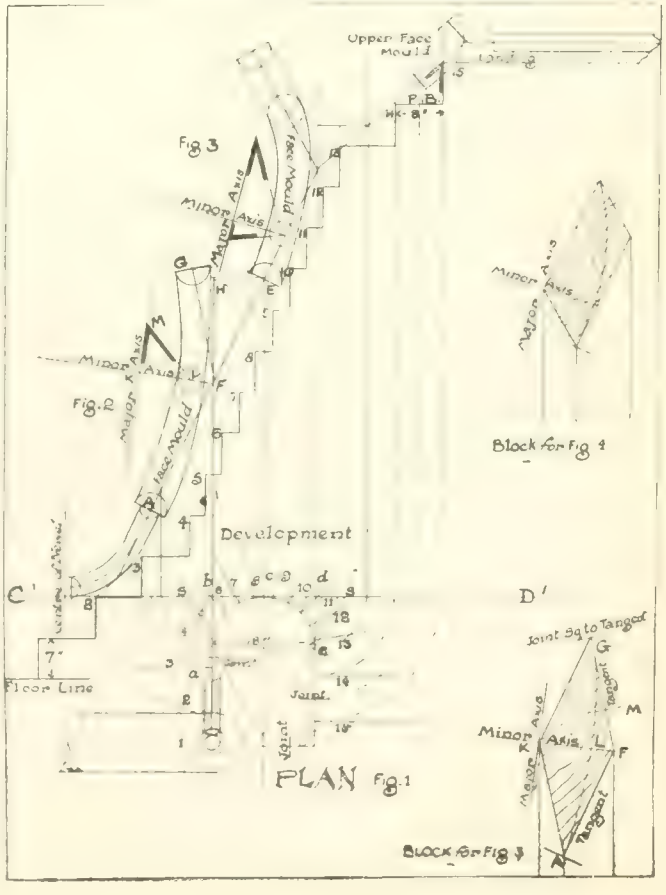
The following is the method for getting out face moulds for a rail for winders on a plan having radius of 9 inches: Fig. 1 is plan of rail; a b c d e, the centre of rail; C^1 D^1, base line; S S, spring line. To get the development of the stretch out, draw line from the apex of a triangle (right angle) having the radius for base, the hypotenuse being inclined at 60 degs., cutting through the several points on the plan and produced until they meet the opposite tangent. Then erect vertical line and mark the height of the risers. Then draw line from top pitch board, at 15 riser to vertical line at riser 12, and then from this point to half-way between 2 and 3 riser drawer definite line.

To get face mould for bottom wreath, Fig. 2, first make EH square to CE, then set your compasses at F and with the distance FE make the dotted line at G, and where it crosses the line HG gives the line FG, which the tangent or centre of rail, make AK parallel to FG and GK parallel to FA gives development.

As to drawing curves for face mould, see June issue) in part 2.

In setting out face mould for upper mould at landing, it should be done same as face mould for scroll in June issue. The casing next newel post will not require any explaining, the drawing being sufficient to convey the idea.

Figs. 3 and 4 show a solid block covering the quarter circle, Fig. 3, being same as the elevation Fig. 2, and lettered the same. There is the pitch on the side of the well, and across the back of well, the bevels for wreath are taken, as shown by line at M between G and F. The tangents being the same length in this wreath, only one bevel is required for the two ends; but in Fig.



* Fourth article of a series. The other articles appeared in June, July and August.

[illegible] two bevels will be required, as the top tangent is shorter than bottom one.

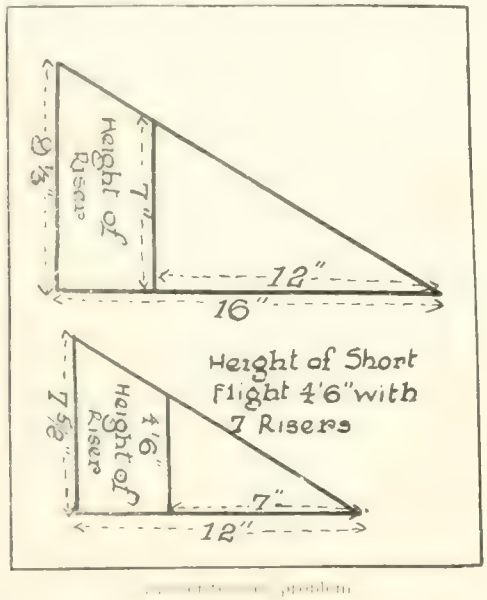
Now to practice: take a block of wood 2¼ in. x 2¼ in. x 12 in., cut it off two pitches, as shown in Fig. 3, and take your bevels from it, turn it, cut side down, and draw a line on the two sides of it; extend them and make them correspond in length to the line AFG, in Fig. 2. [illegible] same lines on as on face mould.

A Stair Problem and its Answer

By A. G. Robb

Here is a [illegible] and the solution of the same which I have never seen published in any book or paper and which, I think, is worth while, as it saves a lot of figuring, especially where you launch into fractions. It also does away with laying out of a rod.

We will suppose we are going to lay out a stair, the height of which, from floor to floor, is 9 ft. 4 in., and you see by your plan that there are 16 risers in the rise. you see by your plan that there are 16 risers in the stair. Get a straight board about 12 in. wide and 24 in. long. Use your steel square and lay off a square mark across



[illegible] problem

measure 9 4-12 in. for the height. Then take one inch for every riser, which in this case would be 16 ins. Connect these two points by drawing the diagonal, then measure back 12 in. from the 16 in. mark and square up to the point where it intersects the diagonal, which, when measured, is the highest of the risers.

It dosen't matter what kind of a stair or sets of steps you lay out, if you follow this rule you will find it correct. The only difference in a short flight of steps, say veranda steps, is that you continue the lines. The tread can be got in the same manner.

Two Handy Steel Square Rules

Two rules that I often have occasion to use are shown herewith:

Fig. 1, to find the circumference of circle by steel square. Draw straight line as 1 2, place 16 on the blade and 5 on the tongue of square. Draw a line on the blade and lay off three times the diameter, as a b c, and with the blade on the line from the point c, draw a line to point 5. The distance 0 to 5 equals the circumference.

Fig. 2, to divide a straight line into any number of equal parts: From a straight line, A B, draw a diagonal, a c. (This may be any angle, but the one shown is a very convenient one.) Set the dividers any distance,

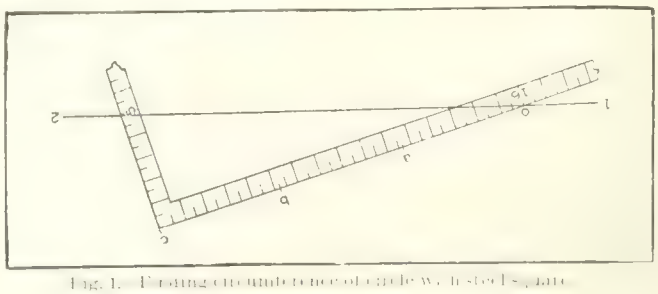


Fig. 1. Finding circumference of circle w. steel square.

the nearer you can guess the better, and from point a space off on diagonal one more space than the required number, as 1-in., 2-in., etc., the point a counting one. With a bevel connect the required length, b, with the last point, as 6-in., and with the same bevel connect the various points, 1-in., 2-in., with line A B.

These two rules, used together, will give the number of

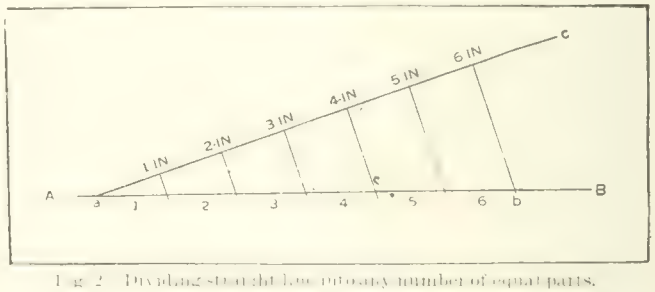


Fig. 2. Dividing straight line into any number of equal parts.

staves required for a tub or column, also the width of staves, the number being known. Unless one is very careful I do not think these will be exact, but will give them approximately, so that any number can be determined for a given lot. T. J. J. in Woodworker.

The Carpenter's Saw

The saw, writes Charles Wicksteed, in the Engineering Review, is one of the very earliest tools known to have been used, and is in fact the earliest tool that has been traced in Egyptian history. It was found first in the form of a notched bronze knife in the third dynasty, or about 5,000 years B.C., and was followed by larger toothed saws in the fourth to fifth dynasties, which were used by carpenters; but there are no dated specimens until the seventh century B.C., when the Assyrians used iron saws. The first knives on record were made out of flint, and were in fact saws with minute teeth. They must have been used for cutting up animals, as the teeth would break away even on soft wood. Rasps, which are but a form of a saw, were first made of sheets of bronze punched and coiled round, but the Assyrians in the seventh century used the straight rasp made of iron exactly like the modern type. Coming down to modern times, the saw is possibly used more than any other tool. It has taken three distinct forms, both for the working of wood and metal; the straight saw, which is simply a development of the first toothed knife, the band saw, and the circular saw.

Concrete Department

Concrete Well Platform

Even with an abundance of fresh air and wholesome food, the health of a country family is largely dependent on the purity of its drinking water. Since the principal source of farm water supply is the bored or dug well, the purity of the water is determined almost entirely by the ability of the well curbing and cover to keep out contaminating surface water. If the well is curbed near the top with solid concrete (or with blocks or bricks laid in Portland-cement mortar) and is covered with a concrete platform, the healthfulness of the water is practically assured.

How to Make the Reinforced Platform

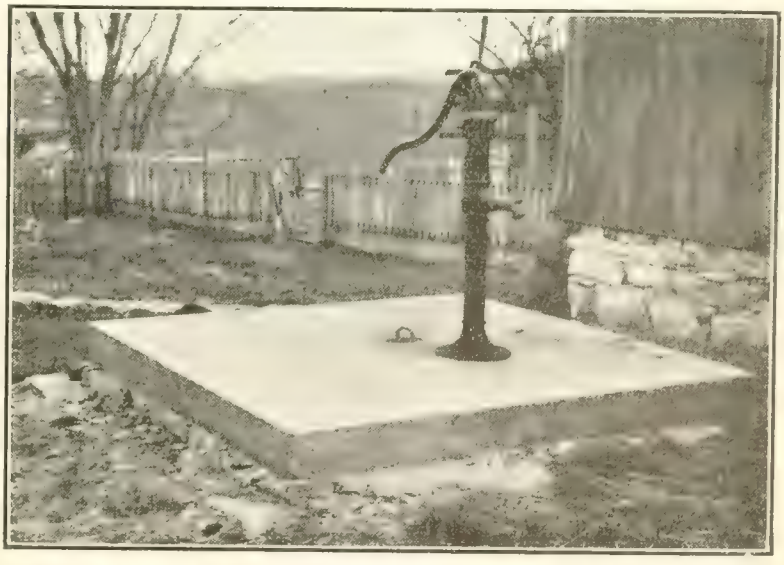
There are several methods of building a concrete well platform. The choice is dependent on the manner in which the pump barrel and stock are joined together. In the illustration is shown a platform 5 inches thick and 5 feet square, which contains a manhole fitted with a concrete lid. The pump stock passes through the platform by means of a circular hole at the side and a part of the manhole opening. By this means the pump stock and barrel can be joined together and slipped into position by a person working through the manhole. Afterwards the concrete manhole lid is set in place. Moreover this lid is heavy enough that it cannot be removed by a child.

In preparing the well for a concrete platform, see that 4 or 5 feet of the curbing near the top of the well is of solid concrete (proportioned 1:2:4), or of blocks or bricks laid up with cement mortar mixed in the proportion of 1 part cement to 1½ parts sand. Carry the curbing 6 or 8 inches above natural ground level and grade the turf to this height so that surface water will flow away from the well. Prepare to mold the cover on a wooden platform of two-inch boards laid over the well or placed on a level spot of ground. For most wells, a platform 5 feet square by 4 inches thick is sufficiently strong. to provide for a manhole opening, build a bottomless box, of 1 by 6-inch boards, 5 inches deep, 2 feet square at the top and 18 inches square at the bottom outside measurements. Another plan is to have a tinsmith make a round bottomless tin form 5 inches deep, 2 feet in diameter at the top and 18 inches at the bottom, after the pattern of a large bottomless dishpan. To either manhole form attach a wooden block of the size and shape of the pump barrel or stock. Grease the manhole frame and set it on the wooden platform where the opening in the well cover is desired.

Proportion the concrete 1 bag of Portland cement to 2 cubic feet of sand and 4 cubic feet of crushed rock, or 1 bag of cement to 4 cubic feet of pit gravel. Have the concrete just wet enough to flush a little cement mortar when tamped into place. Over the entire wooden platform, except within the manhole frame, spread 1 inch of concrete. For reinforcing, immediately place on this concrete 5-foot lengths of ⅜-inch iron rods running in both directions (criss-cross) and spaced 9 inches apart. Bend the ends to a hook-shape. Strengthen the platform around the manhole opening by placing an additional rod on each side. Bring the cover to its full thickness at once by tamping in the remaining four inches of concrete. There will be needed 3 bags of cement, 1-5 cubic yard of sand, 2-5 cubic yard of rock and 6 pieces of ⅜-in. by 10-ft. rods weighing 32 pounds.

For fixing the base of an iron pump securely to the finished well platform, place in the soft concrete around the pump opening ordinary bolts (washered and heads down) to the depth of 4 inches. To locate these bolts correctly, set them by means of a wooden block or templet in which holes have been bored and spaced exactly like those in the pump base. Lag bolts or similar devices may also be used for this purpose. Finish the surface of the platform with a wooden float and steel trowel the same as for sidewalks. If the greased tin form is used, the manhole cover may be cast at the same time as the rest of the floor. Reinforce the lid with short lengths of iron rods laid criss-cross. As a lifting ring use half of an old bridle bit, or a hitching-post ring, the end of which is provided with a knob of twisted wire or with a nut ad a large washer. If the wooden manhole form is used, carefully remove it after four hours. One day later build the manhole lid the same as for the tin form with this exception—place greased paper or cardboard around the edges of the opening to prevent the new concrete from sticking to that of the platform. To make the manhole lid lighter in weight, before placing the concrete, spread 1½ inches of wet sand over the wooden platform inside the manhole opening and then tamp in the concrete. Take care to place the reinforcing within one inch of the bottom of the manhole lid.

After the well platform is two weeks old, carefully remove the wooden boards on which it was built and

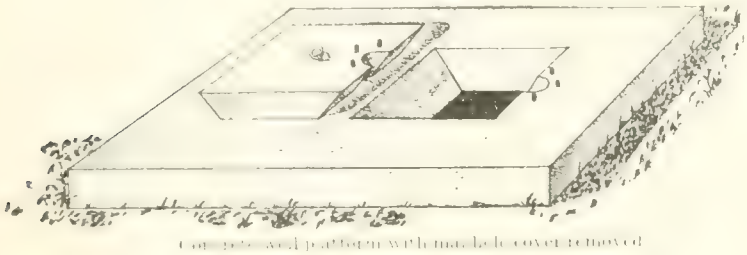


Sanitary well platform of concrete.

set or lower it into place. Give the platform a slope of ½ inch in the desired direction by placing a layer of cement-sand mortar between the well curbing and the platform.

Other Plans of Making the Platform

Some persons prefer to make concrete well platforms in two pieces with the division line through the center of the pump opening. By this means the pump barrel and stock are easily joined and inspection is readily provided for. In other cases where the pump and



Concrete well platform with manhole cover removed

stock can be joined together and lowered into the well as one piece, the concrete platform (removable) is made as a unit and with a single opening merely large enough to receive the pump stock.

Concrete well platforms built according to these methods can be depended on to protect the well from mice, vermin and scrub-water. In pure water there is health.

Waterproofing Concrete Floor

Where water is coming through concrete because of porosity, the Aberthaw Construction Co., Boston, have found that a treatment of boiled linseed oil thinned down with gasoline will do much to cure the trouble. They have built roofs which were to cover delicate instruments in fortification range finders. These roofs proved porous, but a treatment with boiled linseed and gasoline cured the trouble permanently. It is a thoroughly good treatment for porous brick walls, has the merit of being very cheap, and the materials are reasonably available, and the most ordinary laborer can apply it intelligently enough. Besides this method, paraffine can be dissolved in gasoline and applied in a similar way with good results.

There is probably nothing that can be done to make a cement floor acid proof. The treatment with the linseed oil will retard the effect of acid, and, of course, particularly dense concrete will deteriorate more slowly than porous concrete. Where acid is to be used it is economical to give the floors several good coats of linseed oil and gasoline, and if possible during shutdowns to repeat the operation.

Cement in Egypt

The Bulletin Commercial, of Brussels, states that Egypt now offers an important market for cement. In 1911 the imports were 106,670 tons, valued at $800,000, as compared with 87,503 tons in 1910. The great vogue for buildings of ferro-concrete has largely contributed to the remarkable development of the import trade in cement, and this trade seems quite likely to be maintained, in view of the attention which is being given by capitalists to the building industry. The extensive port works recently commenced at Port Said, and those projected at Alexandria, will necessitate the provision of large quantities of cement. The Belgian imports were the largest in 1911, amounting to 50,257 tons, followed by those from England, 35,192 tons. The remainder of the imports came from Austria, France and Germany. Artificial cement (slow hardening) is imported in barrels of 150, 180 and 200 kilos. gross for net. Sacks are taking the place of barrels, owing to the rapidity with which the cement is used. There are, however, cases where barrels are preferred. Natural cement (rapid or semi-slow hardening) is used principally by the natives and also for certain masonry work; it comes mainly from Belgium. This cement is imported in barrels of 140 to 150 kilos. gross for net, and in sacks of 45 to 50 kilos., sacks invoiced. The question of sacks sometimes presents difficulties for the importer. Empty sacks are invoiced to him by the manufactory; if he takes care of them, or returns them only in a bad condition, they are carried to his account. Cement users, however, do not readily agree to these conditions, and the importer eventually suffers the loss. English manufacturers are in the habit of shipping cement in very light bags, which are strong enough for one voyage and are not charged for. This method has given excellent results.

Tensile Tests of Concrete

A series of tests on concrete specimens measuring eighteen inches long by six inches square has recently been made in the engineering laboratory at Cornell University.

The specimens were of three different mixtures, the first a 1:2:4 mixture containing limestone crushed to pass a 1½-inch ring, the second a 1:2:4 mixture containing sandstone, crushed to pass a 2½-inch ring, and the third a 1:2½:5 mixture containing crushed sandstone, similar to that of the second mixture.

In six tests the 1:2:3 limestone concrete showed an average tensile strength of 278 lbs. per square inch, the highest being 308 lbs. per square inch, and the lowest 253 lbs. per square inch.

In nine tests, the 1:2:4 sandstone concrete showed an average tensile strength of 150 lbs. per square inch, the highest being 178 lbs. per square inch, and the lowest 128 lbs. per square inch.

In nine tests, the 1:2½:5 sandstone concrete showed an average tensile strength of 129 lbs. per square inch, the highest being 179 lbs. per square inch, and the lowest being 97 lbs. per square inch.

It is worthy to note that in many instances particles of sandstone were split in two in the plane of the fracture instead of breaking the bond with the mortar; this was particularly so in the case of red sandstone, and illustrates the importance attaching to the selection of aggregates for employment in concrete work.

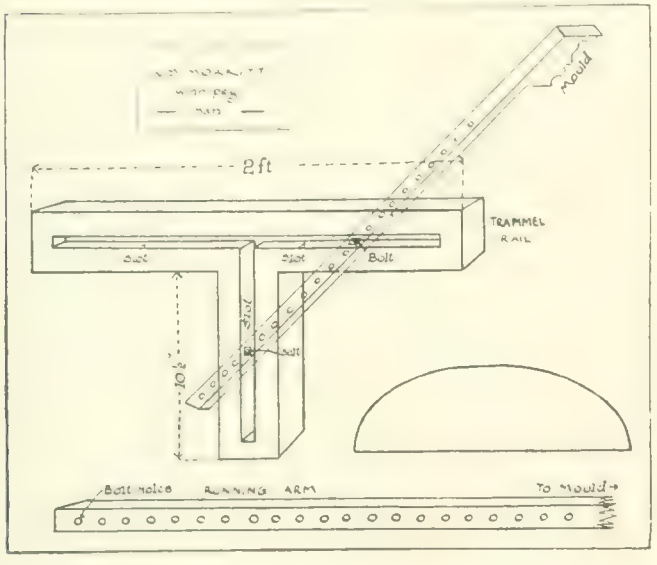
Notice has been given that letters patent have been issued by the Secretary of State of Canada, incorporating Andrew Downey Gall, contractor, and Robert Bennett Hutcheson, notary, both of the City of Westmount, in the Province of Quebec; Louis Gosselin and Alexander Rives Hall, advocates, and Martha Kennedy, stenographer, all three of the City of Montreal, in the said Province of Quebec, for the following purposes, viz.: To undertake the building and construction of roads, railways, canals, wharves, warehouses and like work and buildings of every kind and description, and to carry on business, works and undertakings as engineers, contractors and builders generally; To supply estimates, plans, designs, specifications and all other details and data relating to works and buildings of any description and for any good and lawful consideration; etc.

Brick Work and Plastering

Best Way for Plasterers to Run Elliptical Arches

By W. M. Morritt

The following is an easy way for plasterers to run elliptical arches and put mould on same. By an arrangement as shown in the accompanying sketch, fixing the mould on a trammel rail and setting the running arm at 45 degrees, the mould can be run at one sweep instead of using three points. It can also be used for a



sun line in gauged arches. By tightening the bottom bolt it can be used for semi-arches, and by moving the bolts or studs into the different holes it can be made to run any kind of arches and mould. It can be made any size, but is more convenient 2 ft x 1 ft. The arm can be made any size. The holes are bored about 1½ inches apart in the arm.

What is Terra Cotta?

By J. Keele

There is a considerable vagueness in the mind of the general public with regard to what is meant by "terra cotta."

Various materials, such as fireproofing or hollow building blocks, floor tile, field drain tile, ornamental panels set in brickwork, and the enamelled ware used for facing steel-framed buildings, are all sometimes spoken of as terra cotta.

As the name terra cotta is the Italian equivalent for baked clay, it would, therefore, include, in addition to the wares above mentioned, all other products made of burned or baked clay.

In general, the use of this term in the past was restricted to ornamental pottery made for architectural purposes, and it is used in the same way by clayworkers of the present day. The name "terra cotta lumber" is still applied in the building trades and by others to porous hollow blocks, which are used for backing walls, and for partitions and floors; but, in general, when architects, contractors or clay-workers speak of terra cotta, they mean ornamental clay wares, made for structural work, and which cannot be formed by machinery.

Terra cotta has always been largely used in buildings, and is probably more in favor now than ever. A very pleasing combination is made in a building when the cornices, string courses, door and window heads are made of terra cotta and the walls of brickwork.

May be Made from either Red or Buff Burning Clays

The terra cotta may be made either from red or buff burning clays, without a covering of glaze or enamel, so that the natural color of the burned clay is displayed. On the other hand, the material may be covered with an enamel which conceals the color of the body. Many of the large steel-framed office buildings recently erected are faced entirely with terra cotta, or else have the lower two storeys of stone, with the upper portion all in terra cotta. More than 50 per cent. of the terra cotta now used for city work is enamelled, as, owing to the smooth, impervious covering given by the enamel, it can be kept clean and bright in appearance. The colors usually employed for the enamelled surface are white and cream, or sometimes a slight pink tinge is given, the stronger colors not being used for outside work in this country.

Polychrome or vari-colored terra cotta of high artistic merit is now made by several art potteries and terra cotta works, and this material can be made extremely effective for both interior and exterior decoration when controlled by a competent architect.

Advantages of Terra Cotta

The advantages claimed for terra cotta, when compared with stone, are: Less weight per cubic foot, greater durability, greater range in colors, finer lines of ornamentation, better fire resistance, cheaper cost. Most of the larger cities in Canada have several examples of terra cotta-faced buildings, the material being mostly all imported either from the United States or England.

Raw Materials Used in Manufacture

The raw materials generally used are low grade fire clays, to which are added some grog (ground fire brick, or other burned clay), in order to make the body easier to dry and burn. The body, after burning, is generally some shade of buff, but the enamel which is applied to the exposed faces is opaque and conceals the body color. The manufacture of architectural terra cotta calls for considerable skill and care, and the demands of the architects as to color and form are sometimes very exacting.

No Terra Cotta Produced in Canada

No terra cotta is produced at present in Canada, and as far as we know there are very few clay or shale de-

posits in this country suitable for the manufacture of the enamelled variety. Some of the plastic red burning shales in the vicinity of Toronto are suitable for the manufacture of unglazed terra cotta. The Don Valley brick plant made large quantities some years ago, but have not produced any in recent years. The Port Credit brick works made a quantity of red terra cotta during the present summer from their brick shale. The burned material turned out by this firm was excellent, being smooth in texture, sound in body, and of a good red color. Terra cotta of this kind could be used in brick buildings to great advantage from an architectural point of view, and there seems no reason why quite a large industry could not be maintained near Toronto for the production of it.

Peculiar Behavior of Various Brick Tile

After having been on from four to six weeks, wall tile, without any apparent reason, occasionally fall without any warning from the wall on which they are laid. The contractors claim the fault is due to some inherent property of the tile, some assigning low porosity as the cause, and others, the smooth surface of the tile.

Prof. Dr. H. Seger and E. Cramer, of the Chemical Laboratory of the Clay Industry, Berlin, Germany, carried on some experiments to throw some light on the question. The wall tiles used showed an absorption of 8.5 to 11.2 per cent., and it was found that the tile of low porosity behaved similarly to those of high porosity, as regards their adherence to the wall. Low porosity is, therefore, not the cause of the trouble. A study of the mortars used in the faulty cases showed them to be exceptionally strong and satisfactory, thereby eliminating them as the cause of the failure. An inspection of the wall tile which had fallen off showed, however, that no mortar adhered to them, and that there was evidently but slight bond between the two.

The fact that identical lots of tile were satisfactory in some cases and not in others, led to the belief that perhaps the trouble was due to the method used in applying the tile. In cases where, as a rule, the tile had fallen off, it was found that they had been completely saturated with water before being used, the reason being given that no water could then be absorbed from the mortar. This reason would seem logical enough if only the necessary amount of water had been used which was required for setting. The mortar had been made and used, however, containing much more than this amount of water. The argument given for saturating the tile with water, then, is not founded on reason.

In those cases where the tile had proved satisfactory, it was learned that they had been merely moistened before being laid. From this it seems the failure of the tile to adhere properly was due to the fact that they were saturated with water before being used.

To decide this point, tile were obtained from various concerns, and applied to a brick wall, using different mortars, the tile being so laid that they extend somewhat beyond the edges of the wall. Two sets of each tile were used, one being moistened with water and the other saturated.

The mortars used were of the following mixtures:

1. 1 part cement . . . . . 3 parts sand.
2. 1 part cement . . . . . 5 parts sand.
3. 1 part cement . . . . . 10 parts sand.

After 25 days the tile were torn from the wall by means of a special device, measuring the amount of force necessary The following results were obtained:

Tile	Saturated	Moistened
	USING MORTAR NO. 1	
a	52.2 lbs.	220.5 lbs.
b	16.1 lbs.	236.3 lbs.
c	4.3 lbs.	299.3 lbs.
	USING MORTAR NO. 2	
a	8.9 lbs.	83.3 lbs.
b	1.8 lbs.	82.1 lbs.
c	Did not adhere	93.7 lbs.
	USING MORTAR NO. 3	
a	Did not adhere	44.5 lbs.
b	Did not adhere	12.0 lbs.
c	Did not adhere	31.0 lbs.

To the saturated tile, as a rule, no mortar adhered, the tile falling away clean, while in the case of tile merely moistened, it was found that the mortar was torn asunder, part adhering strongly to the tile.

The results show conclusively that the failure of some wall tile to adhere properly is due to the fact that they are water soaked when applied, and not to their low porosity or to their smooth surface.—Brick.

History of Brick Arches

Writing to the "Scientific American" recently, W. F. Albright gives some interesting history of the brick arch. He states:—

In Babylonia, clay was the common building material from the earliest times, as stone was not easily obtainable. Clay also preceded stone in Egypt (cf. Petrie's excavation in Abydos, 1902). In the Aegean, on the other hand, stone and wood were used; brick constructions are almost unknown (Troy II and III, where stone was hard to procure, and Asiatic influences predominated, do not furnish valid exceptions).

Beyond question the corbeled arch was the earliest type known, and a form familiar to the most widely separated peoples. Such highly finished cupola-forms as the famous "Treasury of Atreus" reach the acme of development in this direction. Here, naturally, Aegean architects stopped. Their stone arches were strong and handsome; what necessity was there for change?

In Babylonia (and Egypt) however, where unburned brick was used, such a structure could not have been lasting, since without adequate support the two opposite walls would soon fall in. While repairing this damage, what could be more natural for the mason than to stumble upon the idea of laying the bricks in directions converging toward the centre? In this way the walls would be held apart, and a little buttressing would prevent the bulging. Indeed, the very ruins of our arch might reasonably suggest the improvement. With the burned-brick arch its evolution was complete, so far as Babylonia is concerned.

A few remarks regarding chronology may be "a propos" here. The correspondent quotes the chronology of Petrie and Breasted in the same breath, and they differ in the period under question by a thousand years! This leads him to an unfortunate inaccuracy in stating the relative ages of certain Egyptian arches. The dates given by Breasted are based on Eduard Meyer's researches, and are, in their broad outlines, accepted by nearly all Egyptologists. The Babylonian dates are no less than 1,500 years too high, as coclusively proved by Father Scheil's discoveries (1911-1912). Accordingly, 3000 B.C. should be read instead of 4500 BC.

Photo showing corner of the Exhibition Grounds.

Exhibits of Builders' Equipment and Supplies

Builders and carpenters found much to interest them at the thirty-fifth Canadian National Exhibition, Toronto.

STAFF REPORT

THE Canadian National Exhibition this year surpassed all records, both in point of attendance and in the number of displays made. The builder who attended found much to interest him in the exhibits of machinery, equipment and supplies. There was everything from nails to completed buildings, and several ideas, new to the Canadian market, were shown for the first time.

A list of those who exhibited goods of interest to the building trade is as follows:

The Hutchison Woodworker Co., Toronto, showed their combination machine in operation, cutting studs, rafters, braces, boring for dowelling, tenoning, dadoing, sandpapering, turning out pulley stiles, window sills and door jambs, routing stair stringers, mitreing of all kinds, and tool grinding.

* * *

Saws of every size and description were shown in the large booth occupied by Henry Disston & Sons, Limited, Toronto. These were grouped in attractive design on a dark background and made what is claimed to be the largest display of saws, knives and tools ever assembled together at an exhibition in Canada. The exhibit of carpenters' hand saws comprised 24 varieties and included almost every kind used by the carpenter and builder. The display, however, was not given up entirely to saws, as other goods used by the builder, such as plumbs, levels, screwdrivers, squares, gauges, planer knives, moulding blanks and narrow band saws, were given prominence in the booth.

* * *

The Elliot Woodworker, Limited, Toronto, had an exhibit in Machinery Hall, and gave demonstrations of the work that may be done on this machine and the ease with which it may be set up in a building. It was shown that with this device it is possible to cross cut, rip, mitre, rabbet, groove, plow, bare, stick mouldings, grind tools, do square turning, etc., right on the job. An interesting feature was the demonstration of stair routing, and it was shown that a stair string can be housed out in 20 minutes.

* * *

The London Concrete Machinery Co., Limited, London, Ont., had an exhibit which showed their concrete mixers, from the small hand machine to the large power variety, operated by the gasoline engines manufactured by this firm. A concrete tile-making machine was working, turning out this class of work. Concrete brick and block machines and diaphragm pumps also were shown in operation. A wide range of concrete tools and wheelbarrows were demonstrated. A working sample of a builders' derrick and sewer pipe moulds attracted attention.

* * *

The Hall Zryd Foundry Co., Limited, Hespeler, Ont., demonstrated the good features of their "Pilot Success" furnace. The special radiator construction, large air space, extra large feed door, combustion chamber and direct draft damper on this furnace make it a good one for household use.

* * *

Batts, Limited, West Toronto, had a large display of their products. The central portion of the exhibit was made up in the form of a house entrance, and showed the columns and line of mahogany doors manufactured by them. On one side of the entrance a pergola was constructed, and in this was displayed "Imperior" oak, Georgia pine, white pine, chestnut, red gum, and birch doors for interior use. A verandah was built on the other side, constructed of the columns and other products manufactured by Batts, Limited. Front doors of every description were displayed on this side. This firm prides themselves on the fact that all goods sold by them are made in their own factory.

* * *

Wettlaufer Bros., Toronto, had the largest exhibit of its kind ever held in Canada. The display occupied a space of 200 x 100 feet, and their concrete mixing machines, builders' hoists, brick-making machines and cement, brick and block making machines were shown in operation. Tile making machines also were featured. In concrete mixers the firm showed all sizes, from the small hand mortar mixing variety to the large road paving outfit. This included continuous mixers, stationary batch mixers and tilting drum mixers. In brick-making machinery, the line embraced all sizes, from the small machine, operated by hand power, that turns out six bricks at a time, to the power variety that has a capacity of 30,000 bricks per day. The line of hoisting machinery was shown in wide range. Wettlaufer Bros. also manufacture gasoline engines and all power machines were run by engines made in the firm's own factory. To demonstrate their line of cement sidewalk finishing tools, the firm had a small section

of concrete laid out and the working of the jointers, edgers, trowels and floats was demonstrated. Besides the above-mentioned lines, included in the exhibit were stone crushers, and pumping outfits, from the smallest hand diaphragm to the large centrifugal, and kindred lines. The stone crusher showed its value to the man who is tearing down a building, for, instead of carting the debris away, it can be crushed and mixed for concrete right on the job. Wettlaufer Bros.' machines will crush all kinds of material, from the finest to the coarsest.

* * *

The Alabastine Hardmortar Co., Limited, Toronto, had an attractive display in the Government Building. It was in the shape of a house, 16 x 12 ft., constructed of "Pulpstone" fireproof gypsum blocks, and the walls were finished in the hardwall plaster made by this firm. "Pulpstone" block is composed of pure gypsum plaster, bonded with high-class fibre and made into block form, in sizes two to six inches in thickness, twelve inches in height and twenty-four inches in length. It is used for fireproofing structural steel, for wall furring, partitions, booktile, insulation from heat and cold, and for deadening sound.

* * *

The A. B. Ormsby Co., Limited, associated with the Metal Shingle & Siding Co., Limited, Preston, Ont., had a couple of displays on the grounds, one of which showed their Acorn Ideal Barn. This barn, 36 x 56 x 18 ft. posts, was erected in five days by three men. It is a steel trussed construction, with galvanized roof and sides, designed to replace the old type of wooden construction. No framing timbers are used, and another feature is that the barn is fire and lightning proof. Besides their displays on the grounds, the firm made a big showing in their new factory at King & Dufferin streets. This included metal roofings, sidings, ceilings, plasterers' corner bead, wall ties, wall plugs, and all sheet metal goods.

* * *

The Asbestos Manufacturing Co., Limited, Lachine, Que., exhibited a model house constructed of their cement shingles and building lumber. This house has been on the Exhibition grounds for the past three years, and has stood the weather test well.

* * *

The George B. Meadows Co., Limited, Toronto, had a large exhibit of grill work and iron stairs. A new feature of this firm's line is a non-slipping cement tread iron stair. Several samples of fencing also were shown.

* * *

The R. Laidlaw Lumber Co., Toronto, occupied large space in the Process Building and showed mahogany and quarter-cut oak doors, verandah columns and samples of wooden stairways.

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The Standard Ideal Co., Limited, had a big corner in the Process Building, and showed their full line of bath tubs, lavatories, mirrors, and bath-room accessories.

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The display of Sturgeons Limited, Toronto, was made up in the shape of two model houses, one finished throughout with "Solignum" and the other with "Paripan." This firm is also agents for the varnishes made by the Holland Varnish Co., Limited, Montreal, and samples of the work done by these products were shown in attractive form.

* * *

The Dennis Wire & Iron Works Co., Limited, Toronto, showed metal lockers, wrought iron panels and bank grills.

The Consumers' Gas Co., Toronto, featured their line of gas lighting fixtures and made a large display of their many lines.

* * *

Clare Bros. & Co., Limited, Preston, had a large display of their "Heela" furnaces.

* * *

Hunt & Sons, Toronto—Egyptian stone for window sills, heads, verandah caps, columns, key stones, etc. Chimney heads and laundry tubs made of this material also were on display.

* * *

The Cockburn Lumber & Concrete Co., Limited, Dundas, Ont.—Fence posts, sewer pipe, tile and concrete bricks.

* * *

Germanite Flooring & Pillar Co.—"Germanite," a patent preparation used in the construction of pillars and laundry tubs. They also showed their flooring, which is applied like tile.

* * *

Balmer & Blakely, Toronto—Plaster of Paris, bronze and oxydized silver relief decorations, and indirect and semi-indirect lighting systems. A feature was a sample of the caen stone cement mantel, manufactured by this firm.

* * *

The Waldon Co., Limited, Toronto and Winnipeg, demonstrated their Spencer self-feeding boilers and pressed iron radiators. This method of heating is gaining favor and many builders are now adopting the method for houses, schools and public buildings.

* * *

The Bow-Latt Lath Holder Co., of Grand Haven, Mich., demonstrated their device for holding lath. The lath are assembled into the device on a bench, a lever is thrown which automatically spaces and locks the lath in position. It is then hung on the studding on the last lath of the break above and is ready for the nails. The makers claim it effects a saving of from 25 to 50 per cent. This is a new device in Canada and the makers exhibited with a view to securing agents in Canada.

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Preston Woodworking Co., Preston, Ont.—Band saws, rip saws, and planers. Demonstrations of the work that can be done were given.

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Keith's, Limited, Toronto.—Heating systems.

* * *

Peace Metal Weather Strip Co., Hamilton.—Metal weather stripping and non-slipping stair treads.

* * *

Chamberlain Metal Weather Strip Co., Kingsville, Ont.—Model windows and doors fitted with their product.

* * *

The Jas. Morrison Brass Manufacturing Co., Toronto, had an excellent display of the latest ideas in gas and electric fixtures. Brass signs and plates, and lavatories and mirrors also were shown.

* * *

The Carborundum Co., Niagara Falls, Ont.—Carborundum for tool sharpening.

* * *

Toronto Electric Light Co., Toronto.—Electric lighting fixtures and supplies.

* * *

Luxfer Prism Co., Limited, Toronto, showed several designs in stained art glass memorial windows and sidewalk prisms.

* * *

Black Building Supply Co., Toronto, had a neat

booth finished in terra cotta and samples of pressed brick. The "Grip-Tight" floor sleeper anchor, a device for anchoring wood sleepers to concrete also was shown.

* * *

Superior Supply Co., Hagersville, Ont.—Kendrick's aerated dry closets, for use in places where there is no water system.

* * *

The National Fireproofing Co. of Canada, Limited, showed their product used in the construction of a wall. A silo constructed of "Natio" hollow tile also was shown.

* * *

Schultz Bros. Company, Limited, Brantford, Ont., showed sectional portable houses. These are used for garages, summer churches, schools, boathouses, residences and, in fact, any building of lighter construction. The house shown was complete in every respect and comprised two commodious bedrooms, a dining-room, kitchen and living-room.

* * *

The Canadian Heating and ventilating Co., Owen Sound, Ont., showed their "Empire" warm air furnaces and side wall registers in their booth in the stove buildings. Their side wall cold air faces made a unique display.

* * *

The Beaver Co., Ottawa, Ont., had a model house finished throughout with Beaver board. A whole house was built and each room was finished with Beaver board and painted in different colors to match the furnishings.

* * *

McDonald & Wilson, Limited, Toronto, had an extensive display of lighting goods.

* * *

The Hamilton Stove & Heater Co., Hamilton. "New Idea" warm air furnaces.

* * *

Canada Hardware Co., Toronto.—A full line of builders' hardware.

* * *

John Hillcock & Co., Toronto.—"Arctic" refrigerators in all sizes for household and store use.

* * *

Eureka Refrigerator Co., Toronto.—Refrigerators of all kinds.

* * *

The James Robertson Co., Limited, Toronto.—Bathroom outfits. This firm has recently secured the agency for the "Peerless" instantaneous water heater.

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The McClary Manufacturing Co., London, Ont., featured their "Sunshine" and "Radium" furnaces in a well-appointed display.

* * *

Shurley-Dietrich Co., Limited, Galt, Ont., showed their extensive line of builders' hand saws. Their "1915 Post Boy Special" is a new addition to the line. This has patent unbreakable handle, made in three styles, and is guaranteed.

The Van Guilder Hollow Wall Co., Rochester, N.Y., showed their hollow wall building machine. This machine can be used in all kinds of continuous hollow wall air chamber buildings and double wall cold storage buildings and samples of the work done were exhibited. This method puts a house within a house, as it were, and the concrete is reinforced with steel.

* * *

The Pease Foundry Co., Limited, Toronto, made a large exhibit of their "Economy" and "Victor" warm air and combination furnaces. Sidewall and floor registers and radiators also were shown.

* * *

The Standard Sanitary Mfg. Co., of Canada, Limited, Toronto, showed two fully-equipped model bathrooms and a full line of their lavatories, tubs, closets and accessories.

* * *

The Eberhard & Wood Manufacturing Co., Toronto, exhibited a model window frame fitted with "Athey" cloth-lined metal weather strip.

* * *

Tallman Brass & Metal Co., Hamilton, Ont., had a well-arranged display of brass railings, door plates, kick plates, push plates, brass window casings and corners, electric fixtures, name plates, and other builders' hardware.

* * *

The Howard Furnace Co., Toronto.—"Howard" furnaces. This furnace is made throughout of cast iron and a guarantee is given that if a furnace is not en-

Exhibit of the Geo. B. Meadows Co., at the Canadian National Exhibition.

tirely satisfactory it will be removed and money refunded.

* * *

The B.O.T. Manufacturing Co., Toronto.—Water closet outfits.

* * *

The National Electric Heating Co., Limited, showed mantels fitted with electric luminous radiators. Electric air heaters for household use also were demonstrated.

* * *

The Radiant Electric Manufacturing Co., Limited, Grimsby, Ont., had a full line of electrical specialties, but their electric mantel grate was of principal interest to builders and contractors.

* * *

Patterson & Heward, Toronto.—Brass name plates, letter boxes, house numbers and brass signs of all kinds.

* * *

Chadwick Brass Co., Limited, Hamilton.—Lighting goods, brass fenders and brass mantel supplies.

* * *

Faircloth Art Glass & Decorating Co., Limited, Toronto.—Lighting goods.

* * *

H. J. St. Clair Co., Limited, 6 Toronto St., Toronto.—This firm exhibited their new all-metal store front construction. This front is absolutely fireproof and is a guarantee against frosted windows.

* * *

The Malott Weather Strip Co., Toronto.—Weather strips, screens and window columns.

* * *

The Canada Acme Weather Strip Co., Toronto.—Weather strips.

* * *

The T. Eaton Co., Limited, had a model house fitted up with the Higgin all-metal screen doors and sides.

* * *

Canadian Bitumastic Enamels Co., Toronto.—Preparation for protecting steel and iron and for waterproofing foundations. This is a solution applied in the form of an enamel.

Gee! This Sounds Good

I want room so I can go out in my own back yard and yell and not attract attention nor the police. There are other essentials: a fireplace—no lares and penates will roost on a radiator, and no love and inspiration breathes out of a grilled hole in the floor—I want to see wood burn. I want trees, big, scaly ones, planted before I was born and to flourish after I'm gone, yet toward which I can indulge in the fool satisfaction of owning them; a hound pup to wag his tail at me and look at me with worship; a cat to sit by the fire and look comfortable; and, when spring comes, hyacinths in the garden and fuzzy little peeping chickens around the doorstep; kittens doing somersaults; a whole ham cooked at once; a table full of my kind of folks to eat and drink with; babies; young folks sparking and sparkable; a neighbor with whom I can sit on his back porch and smoke and find fault with the universe; an enormous bath-room; slippers; no end of clean things—such as towels, napkins and tablecloths; no wall paper, only books everywhere; a den where I can be alone; to travel often enough to appreciate my own harbor.—Frank Crane.

Brick Fireplace Catalogue of Thomas Moulding Brick Co.

Brick Fireplaces is the title of a handsome booklet issued by the Thomas Moulding Brick Company, Chicago, which clearly illustrates the beauty of brick fireplaces for modern homes. There are a dozen or fifteen fireplaces pictured, each of which has a peculiar charm and individuality. They are named for famous authors, such as the Longfellow fireplace, the Ruskin fireplace, the Tennyson fireplace, etc. Each fireplace is briefly described and the price of the brick required for same given, varying from $50.00 to $130.00. Every prospective builder ought to have a copy of this little booklet, which is copyrighted. Presume it will be sent free on application to the Thomas Moulding Company, Chamber of Commerce Building, Chicago.

Notes of the Trade

Andrews Lumber Co., Sault Ste. Marie, Ont., recently incorporated with a capital stock of $50,000.

The Keystone Fireproofing Co. of Canada, Limited, has been authorized to do business in Canada.

Mr. J. C. Bayliss, a prominent contractor of Toronto, Ont., died at his home at Dixie, Ont., on August 18th. The funeral was held from his son's residence, 278 Gladstone Ave., on the 20th.

The Re-enforced Concrete Post Co., Limited, Toronto, recently was granted provincial charter. Capital stock, $50,000. They will manufacture and deal in cement, lime, plaster, whiting, clay, gravel, sand and other building materials.

Sutherland, Davey, Limited, Toronto, is the name of a concern recently incorporated to manufacture and deal in marble, slate, tile, brick, terra cotta, stone, cement, plaster, sewer pipe, gravel, sand and other builders' supplies.

The Anglo-American Building & Construction Co., of Saskatoon, have submitted an ambitious scheme to the city council, whereby they will form a garden suburb and build eight hundred modern houses if the city will make the necessary street railway extensions. The city has fallen in cordially with the idea, and while the extensions cannot be made until the municipal bond market shows a permanent change for the better, they are extending every hope to the company of being able to make the necessary extension.

Public notice has been given under the seal of the Province of Manitoba, incorporating Sidney S. Pocock, grain company manager; Herbert J. Quinn, secretary; James Edward Sexton, real estate agent; William Raymond Sexton, salesman; James Finnin, contractor, and Raymond M. Lee, student-at-law, all of the City of Winnipeg, under the name of "Industrial Builders' Association, Limited," for the purpose of acquiring capital and acquiring by purchase, lease, license, exchange or otherwise, lands or interests therein; to arrange or construct buildings thereon, to sell, lease, exchange or otherwise dispose of said lands and buildings for cash or upon credit and to take and receive mortgages thereon and liens and agreements of purchase and other securities by way of security for the purchase price thereof, and to sell, transfer, assign or mortgage such lands, mortgages, liens, agreements to purchase or other securities, etc.

The by-products from timber and timber waste are getting to be quite an important item in the total returns from forest resources.

Price List of Building Materials Revised to Date

	PRICE AT MONTREAL	PRICE AT TORONTO	PRICE AT WINNIPEG	PRICE AT VANCOUVER
Hemlock Lumber				
2 x 4 in. to 2 x 12 in., 8 to 16 ft.	$24.00	$25.00 to 29.00	$29.00	
2 x 4 in. to 2 x 12 in., 10 ft.	26.00	25.00 to 29.00	29.00	
2 x 4 in. to 2 x 12 in., 18 ft.	28.00 to 30.00	27.00 to 30.00	29.00	
1 in. Hemlock No. 1	22.00	25.00 to 28.00		
No. 1 hemlock decking	23.00 to 25.00	27.00 to 29.00		
No. 2 hemlock dimension and 1 in.	26.00 to 30.00	21.00 to 24.00		
Pine				
1 in. common and better pine 8 to 12 in. wide, rough	$32.00 to 40.00	$28.00 to 35.00		
2 in. red and white pine, bill stock	29.00 to 33.00	29.00 to 34.00		
⅞ x 8 and 10 in. white pine shelving	36.00 to 45.00	36.00 to 40.00		
⅞ x 12 white pine shelving	42.00 to 50.00	45.00 to 48.00		
No. 1 white pine flooring	40.00	33.00 to 37.00		
No. 1 spruce flooring	30.00	28.00 to 32.00		
No. 1 pine decking, D2S	40.00	28.00 to 33.00		
Spruce decking		27.00 to 32.00		
No. 1 pine V. or beaded sheeting	40.00	35.00 to 39.00		
No. 2 pine V. or beaded sheeting	30.00	32.00 to 36.00		
No. 1 Common Yellow Pine				
2 x 4 in. to 2 x 14 in., 10 to 16 ft.		$32.00		
2 x 4 in. to 2 x 14 in., 18 to 20 ft.		34.50		
2 x 4 in. to 2 x 14 in., 22 to 24 ft.		37.00		
Yellow Pine Finish				
4/4 x 6, 8, 10 and 12 B. & B. Steam Finish.		$41.00		
5/4 x " " " "		45.00		
6/4 x " " " "		45.00		
8/4 x " " " "		45.00		
4/4 x " " " Smoke Finish		48.00 to 50.00		
5/4 x " " " "		48.00 to 50.00		
6/4 x " " " "		48.00 to 50.00		
8/4 x " " " "		50.00 to 55.00		
Pine Trim for Paint Finish				
4 in. casing, per 100 ft.	$1.75	$1.80 to 2.00		
5 in. casing, per 100 ft.	2.10	2.00 to 2.50		
8 in. pine base, per 100 ft.	3.25	3.25 to 3.50		
10 in. pine base, per 100 ft.	4.20	4.50		
4 in. pine window stool, per 100 ft.	2.75	3.00		
Shingles, Lath Roofing, Etc.				
XXX B. C. cedar shingles		$3.80 to 4.00 per M	$4.00 & 3.50 per M	$2.20 & 2.10 per M
N. B. Extras		4.00 to 4.40		
No. 1 pine lath	5.00	5.00 to 5.50 per M	5.75 per M	2.25 per M
No. 2 pine lath	4.50	5.00		
No. 1 spruce lath	4.00	4.50		
Metal lath			.16 to .20	
Roofing Felt		1 ply--$1.60 per sq. 2 ply 2.00 " 3 ply 2.40 "	2.50 per roll	
Cedar Posts—Fence				
5 in. at small end	5c. foot	.25 each		
7 in. at small end	7c. foot	.50 each		
Hardware				
Nails, wire, common	$2.30 base keg	$2.35 cwt.	$3.00 per keg	$3.25 per keg
Nails, cut, common	2.50 " "	2.95	3.35	4.25
Sash weights, cast iron	1.50 per 100 lbs.	1.75	2.75	
Tarred felt paper	.43 roll	.65 roll	1.00 per roll	.90 per roll
Building paper	.35 roll	.45	.90	.70
Insulating paper			1.25	
Glass		Star /	Single / Double	
United inches				
Up 25		$4.25 / 6.25	$4.50 / 6.00	
26-40		4.65 / 6.75	4.75 / 6.50	
41-50		5.10 / 7.50	5.25 / 7.25	
51-60		5.35 / 8.50	5.75 / 8.00	
61-70		5.75 / 9.75	6.25 / 9.00	
71-80		6.25 / 11.00	7.00 / 10.00	
81-85		7.00 / 12.50	/ 11.00	
86-90		7.75 / 15.00	/ 12.00	
91-95		/ 17.50	/ 14.00	
96-100		/ 20.50	/ 16.50	

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

Price List of Building Materials—*Continued.*

Glass - *Continued.*	PRICE AT MONTREAL	PRICE AT TORONTO	PRICE AT WINNIPEG	PRICE AT VANCOUVER
101-105	....	24.00	$19.00	
106-110	....	27.50	21.00	
Less 15 per cent. f.o.b. Toronto.				
Wired Glass		20c. per sq. ft		
Brick, Tile, Terra Cotta, Sewer Pipe				
No. 1 dry pressed red brick	18.00	$18.00 per M	$25.00 to 50.00	$45.00 per M
No. 1 dry pressed buff bricks	20.50	18.00	25.00 to 50.00	45.00
Red stock bricks	11.50	12.50	13.00	13.00
Sand Lime Brick	....	8.50 to 9.00	13.00	....
Grey stock bricks	12.00	12.00		
Wire cut bricks for foundation work	10.00	11.50		
Porous terra cotta bricks	....	15.00	$15.00 per M	
No. 1 enamelled bricks, all colors, from	....	80.00 to 150.00	100.00	
Fire brick	25.00	....	45.00	45.00
Oriental Brick	....	30.00	....	....
Roofing tile	....	....	.15 per ft.	
Sewer pipe, 4-inch	10c. foot	....	.10½ per ft.	.14 per ft.
Sewer pipe, 6-inch	15c. foot	....	.16½ per ft.	
Cement, Plaster, Stone, Etc.				
Cement (bags extra)	1.85 bbl.	$1.80 bbl. (1.55 in car lots)	$2.50 per bbl.	$3.00 per bbl.
Sand, for cement or brick work	1.15 ton	1.75 a yard	1.75 a yard	
Lime	.30 per 100 lbs	.35 cwt.	.32 per bu.	1.25 per bbl.
Hydrated lime	10.00	10.00 ton	12.00 per ton	4.25 per bbl.
Mortar color	5.00 bbl.	black, 3; red 1½	.05 per lb.	
Plaster of paris	3.00	$1.50 to 2.50	0.75 per bag	4.50 per bbl.
Crushed stone, 2 in.	1.50 t	1.40	2.50 per yard	
Crushed stone, 1 in.	1.60	1.45	2.75	
Crushed stone, ⅝ in.	1.75	1.50	2.75	
Hardwall plaster	$9.50 to 12.00 neat 6.00 sanded ton	$9.50 to 12.00 neat 4.00 sanded	12.00 per ton	14.50 per ton
Gravel	1.85 yard	1.80	1.85 per yard	
Fair (plaster)	.03 per lb	.04 lb.	1.25 per bale	14.50 per ton

NOTE TO READERS. We would be glad to have suggestions from readers as to the extension or modification of this list.

Book Reviews

Modern American Homes.—By H. V. von Holst, 108 pages, 13 x 9 ins., illustrated, published by the American School of Correspondence, Chicago. Price $2.50.

This volume contains plans, elevation and details of nearly one hundred houses. These include forty-six plates of two-storey houses; 28 of one storey homes; four of tent house, boat house, and garage, twenty of large houses; five of apartment houses: and five plates of miscellaneous buildings. The houses are brick, concrete, stucco and frame. It is a valuable work of reference, and builders will find it of great assistance. They should therefore find a place for it in their library.

Building Construction.—By Charles F. Mitchell, lecturer on Building Construction, Regent St., Polytechnic, London, assisted by George A. Mitchell, who has won several medals for his work in the building field. The work is published by the D. Van Nostrand Co., 25 Park Place, New York. There are two volumes, the elementary edition containing 1,472 pages, selling for $1.50, and the advanced course of 885 pages, for $2.50.

The elementary volume, which is the eight edition, gives a clear statement of the governing principles of building work, all the subject matter being carefully illustrated with about 1,100 drawings. It would be hard to describe the completeness of this work, but a list of the chapters will give an idea of what is contained in this volume:—Chapter I—Instructions for Beginners; 2, Brickwork; 3, Masonry; 4, Girders; 5, Joints in Carpentry; 6, Floors; 7, Partitions; 8, Wood Roofs; 9, Composite Roofs; 10, Iron and Steel Roofs; 11, Joinery; 12, Plumbing; 13, Slating and Tiling; and 14, Building Quantities and Memorandas.

The volume dealing with the advanced course is in its seventh edition and contains about 800 illustrations. There are 28 chapters dealing fully with building materials and methods. It, also, is a valuable work and will be of service to the more advanced builders. It takes up more fully the lines ennumerated above, and as well all the other well-known building materials, and many additional building methods. It deals, for instance, with the design of chimneys, tiles, terra cotta, painting, pillars, girders, sanitations, etc. Calculations and rules are included for figuring the strength of materials, a chapter being devoted to graphic statics or showing graphically the stresses in any member of construction work. These books are well worth reading and studying.

Doubtful Economy

Hans Schmidt, proprietor of a western Minnesota sawmill, used for fuel the sawdust from the factory. It cost him nothing, but it kept four men busy shoveling it. Recently he was persuaded to put in a new equipment which would reduce the amount of fuel one-half.

After the machinery had been installed, the agent called, expecting to be congratulated. But the German eyed him gloomily.

"Doesn't the new plant do all I claimed?" he asked.

"Yah; but I oberlooks sometings," replied Hans.

"What was that?"

"Vell, it takes only two mens to handle de fuel, but it takes de udder dwo mens to haul away what we don't use und a team besides."—Hampton's Magazine.

Take a measure of yourself alongside of others doing the same work, occasionally, to see just how high you stand. Perhaps it will help you to go higher, and certainly it will do you no harm.

Advertisements that Remind You

Queen City Glass Co., Ltd.

Dealers in
PLATE, WINDOW, ORNAMENTAL
and all other Glass required for Buildings
Bevellers, Silverers and Glaziers to the trade
243-247 Victoria Street : TORONTO, ONT.

EUGENE DIETZGEN COMPANY, LIMITED

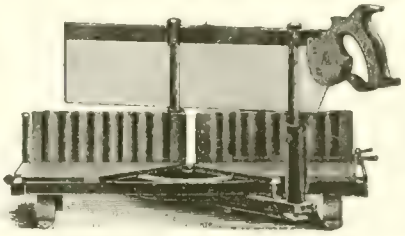
Manufacturers of
Drawing and Surveying Instruments and Supplies
Blue Print Papers, Blue Print Equipment, Blue Printing
116 Adelaide St. W., Toronto

R. Laidlaw Lumber Co., Limited

Everything in Lumber
Timbers, Sash Doors, Columns, Etc.
Head Office: 65 Yonge St., TORONTO

GOODELL MITRE BOX

Made of STEEL *Cannot Break*



First in Quality and Improvements.
Automatic Steps for holding up saw.
Corrugated Backs.
Graduated.
Gauge for duplicate cuts and many other features.
Send for Circular 'D'

GOODELL MFG. CO., Greenfield, Mass.

Powell Lumber and Door Co., Ltd.

KORELOCK and KLIMAX Doors
In Oak, Birch and Fir
LARGE STOCK RIGHT PRICES PROMPT SHIPMENT
310-12 Front Street West, TORONTO

Do away with Sash Weights, Cord, Pulleys, Etc. by using

AUTOMATIC SASH HOLDERS

Proved by use

Easily installed, simple, positive, durable. Saves money, prevents window rattling. For old as well as new windows. No smashed hands from dropping windows, no broken cords. Made in three sizes for sash weighing up to 30 lbs. or more.
If your hardware dealer does not have them, write us for prices, circular, etc.

Smith Hardware Co., Limited

Montreal, Que.

High-Grade Builders' Hardware

Complete line of

Butts	Hinges
Hasps	Staples
Nails	And Other Lines

Mr. Builder: It will pay you to have our Catalogue of Builders' Hardware by you all the time. It's free to readers of The Canadian Builder and Carpenter.

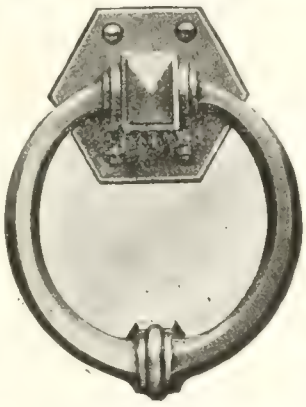
Cowan & Britton, Limited

Gananoque, Ont.

Readers Attention

¶ If you have any little problems you would like solved, write to the Editor.

He will place the problem before all the readers, and thus get the opinion of many on the question.



HARDWARE

Walker's

The illustration shows the celebrated **Maymore Brass Knocker.** A knocker that combines artistic value with real practical use. It's a sample of the high grade line of

BUILDERS' HARDWARE

we carry in stock. You can't beat it anywhere and the wide range of prices offers you an exceptional opportunity to considerably cut down your expenses.

It will pay you to make your inquires NOW

W. Walker & Son (WHOLESALE MERCHANTS TO BUILDERS) 1228 Yonge Street TORONTO

The "Peace" Patent
Improved
Metal Weather Strip
For Windows and Doors

To Carpenters and Builders this weather-strip constitutes a necessary part of the equipment in the building of factories, offices and residential property. It is wind and dust proof, and reduces fuel bills. Windows work easier with than without it. It does away with storm sash, and lasts a lifetime. Write for illustrated pamphlet or further information to

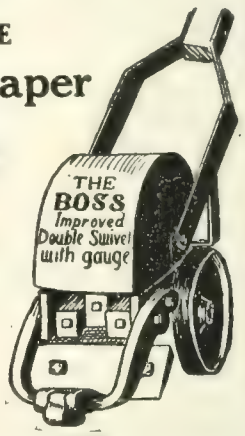
WILLIAM PEACE CO., LIMITED
Bank of Hamilton Building, Hamilton, Ont.
Phone 286 **Live Agents Wanted**

IT WORKS LIKE A PLANE
The Boss Floor Scraper

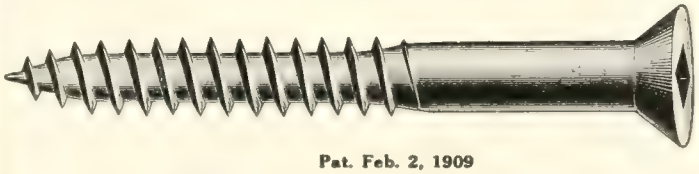
The Boss is the only Floor Scraper made that will plane a floor without leaving a square cut where knife first starts cutting. Why? Because the Boss is made with a Gage on front, to which is attached a pear-shaped wheel which raises when machine is pulled and lets the knife down gradually.

The Boss can be set for any thickness of shaving; it also can be set for any shearing cut right or left, up or down, to suit the kind of lumber.

It is guaranteed to give absolute satisfaction.



G. J. KEPPLINGER
Main Office: **DWIGHT, ILL.**
Manufactured also in London, Canada



See That Square Hole

Pat. Feb. 2, 1909

SOCKET HEAD
WOOD SCREWS

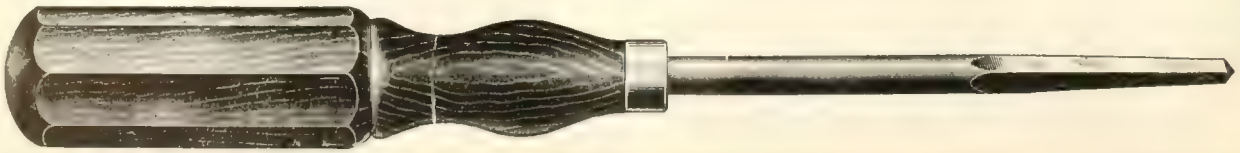
The advantages of this wood screw are many. The screw may be placed on the driver and driven at arm's length, with one hand. It is impossible for the driver to slip out of the socket. Quickly and easily driven. No burred heads.

Saves time, patience, money and material.

Drivers are made in a variety of suitable styles.

Samples, prices and catalogue on request

P. L. Robertson Manufacturing Co., Ltd.
Milton - - Ontario



CLASSIFIED DIRECTORY A BUYER'S GUIDE FOR BUILDERS IN CANADA

Asbestos.
Asbestos Mfg. Co., Montreal.

Asbestos Goods.
Asbestos Mfg. Co., Montreal.

Alabastine.
Alabastine Co., Paris, Ont.

Asphalt Felt
Braid & McCurdy, Winnipeg, Man.

Automatic Gas-Steam Boilers.
Consumers' Gas Co., Toronto.

Axes
Jas. Smart Mfg. Co., Brockville, Ont.

Barrows and Concrete Carts
London Concrete Machinery Co., London, Ont.

Baled Shavings
The R. Laidlaw Co., Limited, Toronto.

Band Saws
Shurley Dietrich Co., Limited, Galt, Ontario.

Beaded Sheets.
Metal Shingle & Siding Co., Preston,

Blinds, outside shutters
The R. Laidlaw Co., Limited, Toronto.

Blinds, Venetian
The R. Laidlaw Co., Limited, Toronto.

Blind Hinges
Jas. Smart Mfg. Co., Brockville, Ont.

Blue Printing
Eugene Dietzgen Co., Ltd., Toronto.

Blue Print Papers
Eugene Dietzgen Co., Ltd., Toronto.

Bolts (Expansion).
Freek, Clark & Co., Toronto.

Brick Stains
Braid & McCurdy, Winnipeg, Man.

Bronze (Cast).
W. H. Thornhill Co., Winnipeg.

Builders' Elevators
Stuart Machinery Co., Winnipeg, Man.

Builders' and Contractors' Supplies
The R. Laidlaw Co., Limited, Toronto.

Builders' Hardware
Jas. Smart Mfg. Co., Brockville, Ont.
Cowan & Britton, Limited, Gananoque, Ontario.

Builders' Tools.
W. D. Beath & Sons, Toronto, Ont.
Freek, Clark & Co., Toronto.

Building Paper
The R. Laidlaw Co., Limited, Toronto.

Butts and Hinges, Steel
Jas. Smart Mfg. Co., Brockville, Ont.
Cowan & Britton, Limited, Gananoque, Ontario.

Burial Vault Molds.
Ideal Concrete Machinery Co., London,

Casement and Sash (Steel and Bronze).
W. H. Thornhill Co., Winnipeg.

Carts, Concrete
London Concrete Machinery Co., London, Ont.

Ceilings, Metal.
Metal Shingle & Siding Co., Preston,

Ceilings and Walls, Embossed Steel.
Galt Art Metal Co., Galt, Ont.

Cement (Portland).
Braid & McCurdy, Winnipeg, Man.
Ontario Lime Association, Toronto.

Cement Pools
Wettlaufer Bros., Toronto, Ont.

Cement Stains
Braid & McCurdy, Winnipeg, Man.

Cement Workers' Tools
London Concrete Machinery Co., London, Ont.

Circular Saws
Shurley Dietrich Co., Limited, Galt, Ontario.

Colors for Concrete.
Ideal Concrete Machinery Co., London,

Columns
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Concrete Block Machines.
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London,
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto.

Concrete Brick Machine.
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London,
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto.

Concrete Sill, Lintel and Dimension Stone Machines.
Ideal Concrete Machinery Co., London.

Concrete Mixers.
C. S. Wert, Kendallville, Ind.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.
Wettlaufer Bros., Toronto.

Concrete Floor Tile Machinery
C. S. Wert, Kendallville, Ind.

Concrete Tile Machines.
Ideal Concrete Machinery Co., London.
Wettlaufer Bros., Toronto.

Concrete Brick Moulds
C. S. Wert, Kendallville, Ind.

Concrete Reinforcements.
W. D. Beath & Sons, Toronto, Ont.
Metal Shingle & Siding Co., Preston.

Construction Companies.
Weber Mfg. Co., West Allis, Wis.

Contractors and Builders.
Weber Mfg. Co., West Allis, Wis.

Contractors' Machinery
Wettlaufer Bros., Toronto, Ont.

Cornices, Galvanized or Copper.
Galt Art Metal Co., Galt, Ont.

Corrugated Sheets (Asbestos).
Asbestos Mfg. Co., Montreal.

Corrugated Sheets (Steel).
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston.
W. D. Beath & Sons, Toronto, Ont.

Crabs
Stuart Machinery Co., Winnipeg, Man.

Cranes
W. D. Beath & Sons, Toronto, Ont.

Crestings.
Metal Shingle & Siding Co., Preston.

Crosscut Saws
Shurley Dietrich Co., Limited, Galt, Ontario.

Crushers
Wettlaufer Bros., Toronto, Ont.

Curb Stone Machines.
Ideal Concrete Machinery Co., London.
W. D. Beath & Sons, Toronto, Ont.

Cutouts.
Duncan Electrical Co., Montreal.

Daylight Rods.
Consolidated Plate Glass Co., Toronto.

Damp Proofing
Braid & McCurdy, Winnipeg, Man.

Deadening Quilt
Braid & McCurdy, Winnipeg, Man.

Derricks.
W. D. Beath & Sons, Toronto, Ont.
Ideal Concrete Machinery Co., London
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.

Doors
Batts, Limited, Toronto.
Wm. Rutherford, Sons & Co., Limited, Montreal, Que.
The Bryan Mfg. Co., Collingwood, Ont.

Doors (Wooden).
Batts, Limited, Toronto.
Canada Lumber Co., Toronto.
L. A. DeLaplante, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.
Georgian Bay Shook Mills, Limited, Midland, Ont.

Doors, Veneered
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Door Trimmings.
Metal Shingle & Siding Co., Preston,
W. H. Thornhill Co., Winnipeg.

Doors (Sheet Steel and Bronze).
W. H. Thornhill Co., Winnipeg.

Drag Scrapers
London Concrete Machinery Co., London, Ont.

Drain Tile Machinery
C. S. Wert, Kendallville, Ind.

Drawing Materials
Eugene Dietzgen Co., Ltd., Toronto.

Driers
London Concrete Machinery Co., London, Ont.

Drill Grinders.
Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

Eavestrough.
Metal Shingle & Siding Co., Preston,

Eave-Trough and Conductor-Pipe.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston.

Edge Tools
Jas. Smart Mfg. Co., Brockville, Ont.

Electrical Fixtures and Specialties.
Duncan Electrical Co., Montreal.
W. H. Thornhill Co., Winnipeg.

Engineers' Instruments and Supplies
Eugene Dietzgen Co., Ltd., Toronto.

Expanded Metal.
Galt Art Metal Co., Galt, Ont.

Fasteners, sash and screen
Cowan & Britton, Limited, Gananoque, Ontario.

CLASSIFIED DIRECTORY—*Continued*

Fences.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Fence Post Mould
London Concrete Machinery Co., London, Ont.

Finials.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston.

Fire Escapes.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Fireproof Windows.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston,

Flooring, Hardwood.
Georgian Bay Shook Mills, Midland.

Flooring and Supplies
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Floor Scrapers
Braid & McCurdy, Winnipeg, Man.
Fox Supply Co., Brooklyn, Wis.
Hurley Machine Co., Limited, Toronto.

Forge and Rivet Heaters.
Consumers' Gas Co., Toronto.

Furnaces
Jas. Smart Mfg. Co., Brockville, Ont.

Furnaces, Hot Air.
Hall Zyrd Foundry Co., Hespeler, Ont.

Galvanized Chain Pumps.
Metal Shingle & Siding Co., Preston.

Galvanized Iron Cornices.
Metal Shingle & Siding Co., Preston.

Galvanized Tanks.
Metal Shingle & Siding Co., Preston.

Gas Blow Pipes.
Consumers' Gas Co., Toronto.

Gas Engines.
Consumers' Gas Co., Toronto.

Gas Furnaces.
Consumers' Gas Co., Toronto.

Gas Lighting Appliances.
Consumers' Gas Co., Toronto.

Gas Fixtures.
Consumers' Gas Co., Toronto.

Gasoline Engines.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Wettlaufer Bros., Toronto, Ont.

Gas Piping.
Consumers' Gas Co., Toronto.

Gas Ranges.
Consumers' Gas Co., Toronto.

Gas Water Heaters.
Consumers' Gas Co., Toronto.

Gates.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Glass.
Consolidated Plate Glass Co., Toronto.
The Toronto Plate Glass & Importing Co., Toronto.
Queen City Glass Co., Toronto.

Glue Pot Heaters.
Consumers' Gas Co., Toronto.

Granite (Crushed).
Sand & Supplies Toronto.

Gravel
Braid & McCurdy, Winnipeg, Man.

Gravel Screens (Power).
Ideal Concrete Machinery Co., London.

Hair (Plasterers').
Ontario Lime Association, Toronto.

Hammers.
Double Claw Hammer Co., Brooklyn, N.Y.
Lewis Bros., Montreal.
Jas. Smart Mfg. Co., Brockville, Ont.

Hand Scrapers.
Fox Supply Co., Brooklyn, Wis.

Hand Saws
Shurley Dietrich Co., Limited, Galt, Ontario.

Hardware.
Weber Mfg. Co., West Allis, Wis.

Hardwood Flooring
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.
Siemon Bros., Ltd., Toronto.

Hangers and Fasteners
Cowan & Britton, Limited, Gananoque, Ontario.

Hangers, sash and screen
Cowan & Britton, Limited, Gananoque Ontario.

Hasps
Cowan & Britton, Limited, Gananoque, Ontario.

Herringbone Lath.
Metal Shingle & Siding Co., Preston, Ont.

Hinges
Cowan & Britton, Limited, Gananoque, Ontario.

Hooks
Cowan & Britton, Limited, Gananoque, Ontario.

Hoists.
Ideal Concrete Machinery Co., London.
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.
Wettlaufer Bros., Toronto.
W. D. Beath & Sons, Toronto, Ont.
Wettlaufer Bros., Toronto, Ont.

Hoisting Engines
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.

Interior House Finish.
Batts, Limited, Toronto.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Midland, Ont.
The Bryan Mfg. Co., Collingwood, Ont.
Wm. Rutherford, Sons & Co., Limited, Montreal, Que.

Jack Screws
Jas. Smart Mfg. Co., Brockville, Ont.

Keene's Cement
Braid & McCurdy, Winnipeg, Man.

Kindling Wood
The R. Laidlaw Co., Limited, Toronto.

Lath.
Galt Art Metal Co., Galt, Ont.
The Bryan Mfg. Co., Collingwood, Ont.
The R. Laidlaw Co., Limited, Toronto.

Lath (Metal)
Braid & McCurdy, Winnipeg, Man.

Lime.
Ontario Lime Association, Toronto.

Lime, White or Gray
Braid & McCurdy, Winnipeg, Man.

Lumber
Batts, Limited, Toronto.
Canada Lumber Co., Toronto.
The R. Laidlaw Co., Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Mantels
Kent, Garvin & Co., Hamilton.

Metal Roofing and Siding.
Galt Art Metal Co., Galt, Ont.

Mortar Cement
Braid & McCurdy, Winnipeg, Man.

Mortar Colors.
Manton Bros., 105 Elizabeth St., Toronto.
Ontario Lime Association, Toronto.

Mitre Box
Goodell Mfg. Co., Greenfield, Mass.

Mortar Gauges.
Ideal Concrete Machinery Co., London.

Mortar Mixers
London Concrete Machinery Co., London, Ont.

Mortar Stains
Braid & McCurdy, Winnipeg, Man.

Mouldings.
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.
Builders' Moulding Co., Toronto.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.
Wm. Rutherford, Sons & Co., Limited, Montreal, Que.

Nails (Self-clinching).
Freek, Clark & Co., Toronto.

Ornamental Iron Work.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto.

Nail Pullers
Cowan & Britton, Limited, Gananoque, Ontario.

Nails
Cowan & Britton, Limited, Gananoque, Ontario.

Ornamental Moulds
London Concrete Machinery Co., London, Ont.
Ideal Concrete Machinery Co., London.

Paints (Waterproof).
Freek, Clark & Co., Toronto.

Paint Protective
Braid & McCurdy, Winnipeg, Man.

Plaster.
Alabastine Hard Mortar Co., Ltd.
Alabastine Co., Limited, Toronto.
Ontario Lime Association, Toronto.
Braid & McCurdy, Winnipeg, Man.

Plaster (Hardwall).
Alabastine Co., Paris, Ont.
Ontario Lime Association, Toronto.
Crown Gypsum Co., Lythmore, Ont.

Plaster Corner Bead.
Metal Shingle & Siding Co., Preston.
Braid & McCurdy, Winnipeg, Man.

Plaster Paris.
Alabastine Co., Paris, Ont.
Ontario Lime Association, Toronto.

Plaster Stains
Braid & McCurdy, Winnipeg, Man.

Planing Mills
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Pulpstone.
Alabastine Co., Paris, Ont.

Pumps.
Jas. Smart Mfg. Co., Brockville, Ont.
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.
Wettlaufer Bros., Toronto, Ont.

Railings.
Dominion Ornamental Iron Co., Ltd., Toronto.
George B. Meadows, Toronto

Ready Roofing
The R. Laidlaw Co., Limited, Toronto.

Receptacles (Electrical).
Duncan Electrical Co., Montreal.

Registers
Jas. Smart Mfg. Co., Brockville, Ont.

Ridge, Galvanized.
Metal Shingle & Siding Co., Preston.

Ridgings.
Metal Shingle & Siding Co., Preston.

Rock Crushers
Wettlaufer Bros., Toronto, Ont.

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In the selection of builders' hardware, the style of architecture determines the design. In the selection of locks, the governing factor must be security.

We have put into Yale Cylinder Locks all the security and convenience that human skill and ingenuity could suggest. We have surrounded these locks with accessory hardware of such real beauty that any scheme of decorative treatment is enhanced by its use.

Yale designs faithfully portray the best of all schools of ornament. Yale Locks and Hardware sold in Canada are now made in Canada. Ask us for our book "A Word About Yale Locks and Hardware."

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Makers of Yale Products in Canada:

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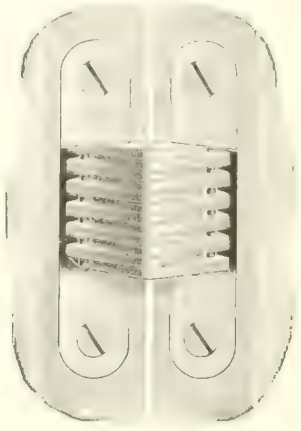
Soss Invisible Hinge

For use on Panel Work, Lockers Closets, Counter Flaps, Partition Doors, Cabinets, etc.



Soss Invisible Hinges are made in a variety of sizes, the largest being adapted for largest size door.

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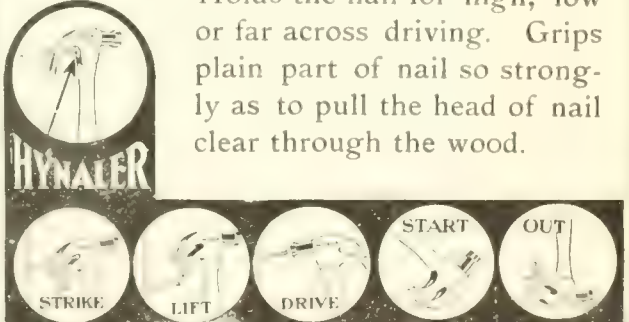
Order the "HYNALER"

Best single claw hammer ever made. Holds the nail for high, low or far across driving. Grips plain part of nail so strongly as to pull the head of nail clear through the wood.



BEST HAMMER EVER MADE

Order the **"Double Claw."** Drives faster than single claw hammer. Holds the nail for starting to drive where you cannot reach with two hands. Pulls the nail out straight without a block. All jobbers. Your own dealer will get it for you.

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Roofing.
Asbestos Mfg. Co., Montreal.
W. D. Beath & Sons, Toronto, Ont.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston, Ont.
Patterson Mfg. Co., Limited, Toronto.
Braid & McCurdy, Winnipeg, Man.

Roofing Tile Machines.
Ideal Concrete Machinery Co., London.

Sand
Braid & McCurdy, Winnipeg, Man.

Sand Screens
Locked Wire Fence Co., Hamilton, Ont.

Sand and Gravel.
Sand & Supplies. Toronto.

Sand Sifting Machines
London Concrete Machinery Co., London, Ont.

Sash.
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.
L. A. DeLaplante, Limited, Toronto.
Georgian Bay Shook Mills, Limited, Midland, Ont.
Wm. Rutherford, Sons & Co., Limited, Montreal, Que.
The Bryan Mfg. Co., Collingwood, Ont.

Sash Holders
Smith Hardware Co., Montreal.

Sash Balances.
Freek, Clark & Co., Toronto.

Sashes and Doors.
Batts, Limited, Toronto.
Pembroke Lumber Co., Pembroke, Ont.
The R. Laidlaw Co., Limited, Toronto.

Scaffold Brackets (Builders')
Folding Scaffold Bracket Co. Detroit.

Scraper Knives.
Fox Supply Co., Brooklyn, Wis.

Scrapers.
Fox Supply Co., Brooklyn, Wis.
Hurley Machine Co., Toronto.

Scrapers, Drag
London Concrete Machinery Co., London, Ont.

Scrapers, Wheel
London Concrete Machinery Co., London, Ont.

Scraper Sharpening Device.
Fox Supply Co., Brooklyn, Wis.

Screens, Sand
London Concrete Machinery Co., London, Ont.

Screens and Sidewalk Tools
Wettlaufer Bros., Toronto, Ont.

Screens, window and door
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Seats, Implement.
Galt Art Metal Co., Galt, Ont.

Sewer Pipe.
Ontario Lime Association, Toronto.

Sewer Pipe Moulds
London Concrete Machinery Co., London, Ont.
Ideal Concrete Machinery Co., London,

Shingles, Galvanized Steel.
Galt Art Metal Co., Galt, Ont.

Shingles
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Shingles, Wood
The Bryan Mfg. Co., Collingwood, Ont.

Shingle Stain
Braid & McCurdy, Winnipeg, Man.

Sidewalk Dividing Plates
London Concrete Machinery Co., London, Ont.

Sidewalk Forms, Steel
London Concrete Machinery Co., London, Ont.

Sill and Cap Moulds
London Concrete Machinery Co., London, Ont.
Ideal Concrete Machinery Co., London.

Silo Block Machines
London Concrete Machinery Co., London, Ont.

Sockets, Brass and Porcelain.
Duncan Electrical Co., Montreal.

Soldering Iron Heaters.
Consumers' Gas Co., Toronto.

Sound Deadener
Braid & McCurdy, Winnipeg, Man.

Shooks.
Georgian Bay Shook Mills, Midland,

Skylights.
Metal Shingle & Siding Co., Preston,
Galt Art Metal Co., Galt, Ont.

Sidewalk Prisms.
Consolidated Plate Glass Co., Toronto.

Sidewalk Gratings
Locked Wire Fence Co., Hamilton, Ont.

Siding, Steel.
Galt Art Metal Co., Galt, Ont.

Sill and Cap Molds.
Ideal Concrete Machinery Co., London,

Sinks (Kitchen and Wash).
Standard Ideal Co., Port Hope, Ont.

Spanish Roofing Tile Machines.
Ideal Concrete Machinery Co., London,

Stairs, Iron.
Dom. Ornamental Iron Co., Ltd., Toronto
George B. Meadows, Toronto

Stairways
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Staples
Cowan & Britton, Limited, Gananoque, Ontario.

Stanchions.
Metal Shingle & Siding Co., Preston,
W. D. Beath & Sons, Toronto, Ont.

Stairs
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Steel Buildings and Garages.
Metal Shingle & Siding Co., Preston,
W. D. Beath & Sons, Toronto, Ont.

Steel Ceilings and Walls.
Galt Art Metal Co., Galt, Ont.

Steam Room Brick and Block Cars
C. S. Wert, Kendallville, Ind.

Steam Engines
Wettlaufer Bros., Toronto, Ont.

Stone (Crushed).
Ontario Lime Association, Toronto.
Sand & Supplies, Toronto.

Store Front Bars.
Consolidated Plate Glass Co., Toronto.

Store Fronts
Braid & McCurdy, Winnipeg, Man.

Storm Windows
Cowan & Britton, Limited, Gananoque, Ontario.

Storm Sash
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Store Fixtures
Batts, Limited, Toronto.
Metal Shingle & Siding Co., Preston.
The R. Laidlaw Co., Limited, Toronto.

Surveying Instruments
Eugene Dietzgen Co., Ltd., Toronto.

Terra Cotta.
Braid & McCurdy, Winnipeg, Man.
W. H. Thornhill Co., Winnipeg.
Toronto Plate Glass Importing Co., Toronto.

Thimbles.
Metal Shingle & Siding Co., Preston,

Tile, Block and Brick Cars
London Concrete Machinery Co., London, Ont.

Tile (Hollow)
Braid & McCurdy, Winnipeg, Man.

Tile Machine, Drain
London Concrete Machinery Co., London, Ont.

Tile Machine, Sidewalk
London Concrete Machinery Co., London, Ont.

Ties (Brick)
Braid & McCurdy, Winnipeg, Man.

Timber
The R. Laidlaw Co., Limited, Toronto.

Tool Sharpeners.
Luther Grinder Mfg. Co., Milwaukee, Wisconsin.

Transmission Machinery
Stuart Machinery Co., Winnipeg, Man.

Transfer Cars
London Concrete Machinery Co., London, Ont.

Valley, Galvanized.
Metal Shingle & Siding Co., Preston,

"V" Crimp Roofing and Siding.
Metal Shingle & Siding Co., Preston,

Ventilators.
Galt Art Metal Co., Galt, Ont.
Metal Shingle & Siding Co., Preston.

Verandah Columns
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Wall Board
Braid & McCurdy, Winnipeg, Man.
The R. Laidlaw Co., Limited, Toronto.

Wall Plugs.
Ideal Concrete Machinery Co., London,

Wall Coating.
Alabastine Co., Paris, Ont.

Warm Air Heaters
Jas. Smart Mfg. Co., Brockville, Ont.

Waterproof Paper
Braid & McCurdy, Winnipeg, Man.

Waterproofing.
Ideal Concrete Machinery Co., London,
W. H. Thornhill Co., Winnipeg.

Watering Bowls for Stock.
Metal Shingle & Siding Co., Preston,

Weather Strips.
William Pease Co., Hamilton.

Well Moulds
C. S. Wert, Kendallville, Ind.

Window Frames—Complete.
Pembroke Lumber Co., Pembroke, Ont.

Window Frames
Batts, Limited, Toronto.
The Bryan Mfg. Co., Collingwood, Ont.

Window Guards
Locked Wire Fence Co., Hamilton, Ont.

Window Trimmings.
Metal Shingle & Siding Co., Preston,
W. H. Thornhill Co., Winnipeg.

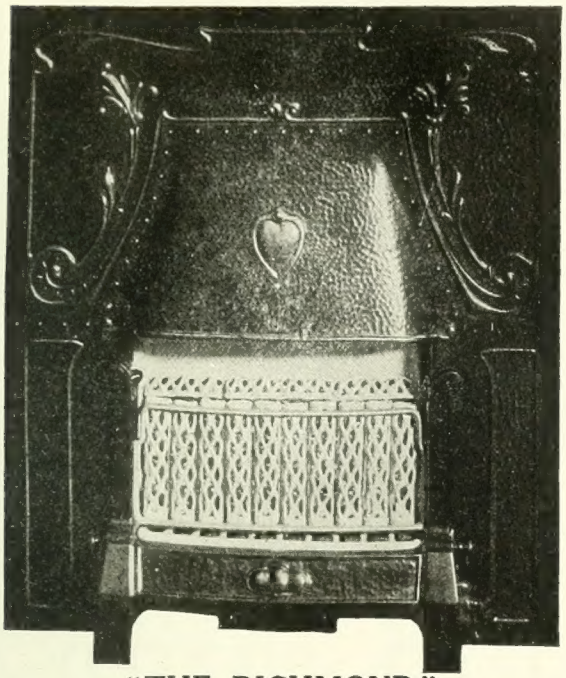
Window Screens
Batts, Limited, Toronto.
The R. Laidlaw Co., Limited, Toronto.

Wire Rope
London Concrete Machinery Co., London, Ont.
Stuart Machinery Co., Winnipeg, Man.

Wire Work (Special)
Locked Wire Fence Co., Hamilton, Ont.
George B. Meadows, Toronto.

Woodworkers.
Elliot Woodworker Co., Toronto.
Parks Ball Bearing Machine Co., Cincinatti, Ohio.
M. Hutchinson, Toronto.

Consider the Heating Problem



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Every Home Owner or Builder should consider the gas grate proposition. Thousands of homes in Toronto have grates installed that are very inefficient and practically useless because they were installed more with a view to cheapness rather than service.

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The "Richmond" Gas Grate shown here is a new departure in Gas Grates. It is the result of years of scientific research to find a Gas Grate that would actually *radiate* nearly all its heat, yet at the same time be *absolutely odorless.* Although the modern Gas Grate is becoming more and more a prominent feature in the house, it is essentially a most important point when choosing a Gas Grate to see that it possesses the highest *efficiency, economy, and utility for all general purposes*—and to obtain these with complete satisfaction you cannot do better than get a *"Richmond."* The illustration shows the nature of its construction. It is real English in manufacture and comes in various finishes, chief of which are—Art Copper, Art Brass and Black Berlin. See these demonstrated at our salesroom, it will convince you of their *Radiant heat properties* and its *economy.* Several designs and reasonable terms.

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Soligum
WOOD PRESERVATIVE & STAIN

Made in Hull, England

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Color Stain for Shingles and Outside Woodwork in Greens, Reds and Browns

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A Lacquer Enamel, attributes:

Brilliant Surface

Washable and Sanitary

All different colors for inside and outside use

Cheap as Paint but much superior

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Can be made by selling

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STEEL SHINGLES CORRUGATED IRON ROOFING EXPANDED STEEL LATH
METAL CEILINGS AND WALLS, METAL SIDINGS, ETC.

Many Carpenters and Builders have, during the last few years, added to their income by selling our goods.

Write for Full Particulars

THE GALT ART METAL CO., LIMITED

174 STONE ROAD :: GALT, ONT.

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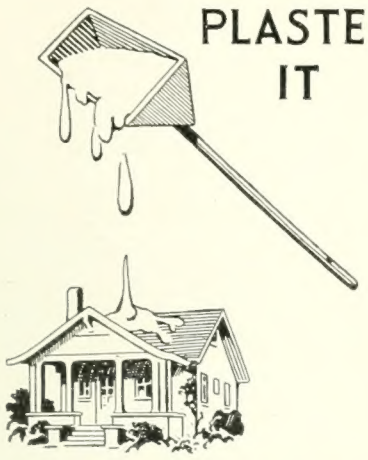
DO N'T PLASTER IT



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IT REQUIRES NO FURTHER FINISH

¶ This Wall Board is waterproofed on both sides; and can be easily washed. The best finish for walls and ceilings of Kitchens, Dining Rooms, Parlors, Living Rooms, Bedrooms and Attics.

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M. 1232

Braid & McCurdy

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204 Farmer Bldg.

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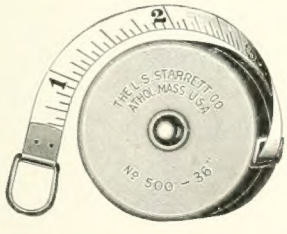
either this 60" Starrett Steel Tape or this Starrett Universal Scraper



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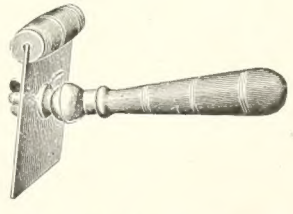

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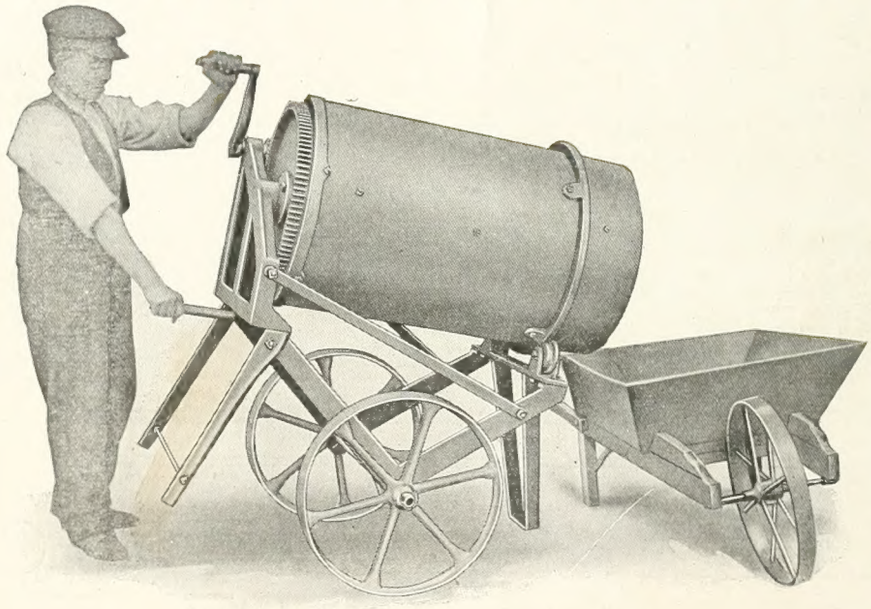

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